

TRANSACTIONS

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AGRICULTURAL AND HORTICULTURAL
SOCIETY OF INDIA.

VOL. VII.

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THE Committee appointed by the Agricultural and Horticultural Society to direct the publication of the Papers read before them, takes this opportunity to inform the Public that the grounds of its choice are and will continue to be, the importance and singularity of subjects, or the advantageous manner of treating them; without pretending to answer for the facts or the propriety of the reasonings, contained in the several papers so published, which must still rest on the credit or judgment of their respective authors.

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Tea Tracts

in the Mulluck Country

in acres

<i>Nudwah</i>	<i>3</i>	<i>Merrie Patar</i>	<i>1</i>	<i>agru</i>
<i>Deerjoy</i>	<i>1</i>	<i>Boogdone</i>	<i>1</i>	<i>unur</i>
<i>Chubwah</i>	<i>3</i>	<i>Hinga Beel</i>	<i>1</i>	<i>udo</i>
<i>Gurbandy</i>	<i>1</i>	<i>Hilahdury</i>	<i>1</i>	<i>long</i>
<i>Fingri</i>	<i>3</i>	<i>Deam</i>	<i>2</i>	<i>una</i>
<i>Geelah Jhan</i>	<i>1</i>	<i>Madar Khat</i>	<i>1</i>	<i>to</i>
<i>Koorkany Fingri road</i>	<i>1</i>	<i>Ecoratolly</i>	<i>1</i>	<i>mch</i>
<i>Baxalany D°</i>	<i>1</i>	<i>Singallee Jhan</i>	<i>2</i>	<i>ap A</i>

APPENDIX.

SUMMARY

OF .

THE SUCCESS WHICH HAS ATTENDED THE EFFORTS

OF THE

AGRICULTURAL AND HORTICULTURAL SOCIETY

AT INTRODUCING

AMERICAN AND OTHER VARIETIES OF FOREIGN
COTTON INTO INDIA.

To W. LIMOND, Esq.

Secretary to the Bengal Chamber of Commerce.

SIR,

At the meeting of the Agricultural and Horticultural Society of India, held on the 8th ultimo, I had the honor to read your letter with the documents which accompanied it, and in return for so valuable a communication, I have received the commands of the Society to express to you how alive it felt to the importance of the great measures adverted to by the Bengal Chamber of Commerce and by the President, Vice-President, and Members of the Chamber of Commerce and Manufactures at Manchester, of promoting, by every means in its power, the staple productions of India, and that of Cotton in particular.

In evidence of the great interest felt by the Agricultural and Horticultural Society of India on the subject, I am instructed to inform you that the efforts of the Society in the advancement of this great object, date their origin so far back as the year 1820, the period of the foundation of the Institution. For although the early history of the Proceedings of the Members do not bear on the face of them any striking record of great attainment in the promotion of cotton cultivation, yet the act of forming themselves into a Society attests the fact that the European community of the Metropolis of India were convinced of the necessity of doing their utmost to advance

this, as well as other important cultures, “ by encouraging the industry of the country.”

The first distinct measure of operation occurred in the year 1829, when the Members adopted the recommendation of their Committee and tendered their declaration, “ that sugar, *cotton*, coffee, silk, and other staples of commerce were the objects of the Society’s *special* encouragement.”

At the close of the same year (1829) an intimation was received, that the Government of Bengal was desirous of co-operating with the Society to promote for exportation, the production of articles of raw produce of an improved description. On learning this the Society invited the Government to adopt immediate means for improving, by the distribution of seeds, plants, useful information and premiums, the condition of the existing staples of the country. A suggestion which was at once approved of by the state authorities, who, to ensure the efficiency of the measure, placed at the disposal of the Society, the sum of 20,000 rupees (£2000),—and, in further aid of the Society’s efforts, an experimental Farm was authorized, for which the annual sum of 10,000 rupees (£1000), exclusive of rent, was allowed; and 4500 rupees for buildings and stock for the first year. A schedule of prizes, of which the annexed is a correct printed copy, was thereon issued to the public;—but before successful competitors could be found for the whole, the Agency-House in which the funds were deposited, failed, and the money went in the general wreck.

Schedule of Prizes.

The Governor General in Council having placed at the disposal of this Society the sum of Sicca Rupees 20,000 to be distributed in premiums to the most successful cultivators of *Cotton*, *Tobacco*, *Sugar*, *Silk* and other articles of Raw produce, the growth of this Presidency, the Society is desirous of making know the Conditions under which the distribution is to take place.

Two distinct classes of premiums are offered.

FIRST CLASS, or Premiums for Fine Samples.

SUGAR.

- 1st.—For the best Sample of Raw Sugar, not less than two maunds, Sa. Rs. 500
- 2nd.—For the next best Sample of Raw Sugar, not less than two maunds, 250

SILK.

3rd.—For the best Sample of Silk, not less than 5 seers, .. 500

4th.—For the next best Sample of Silk, not less than 5 seers, 250

TOBACCO.

5th.—For the best Sample of Native Tobacco, fit for the European Market, not less than 1 maund, 250

6th.—For the next best Sample of Native Tobacco, fit for the European Market, not less than 1 maund, 125

7th.—For the best Sample of any Foreign kind of Tobacco, fit for the European Market, not less than 1 maund, 250

8th.—For the next best Sample of any Foreign kind of Tobacco, fit for the European Market, not less than 1 maund, 125

COTTON.

9th.—For the best Sample of Sea Island Cotton, not less than 1 maund, 250

10th.—For the next best Sample of Sea Island Cotton, not less than 1 maund, 125

11th.—For the best Sample of Upland, or green Seed Cotton, not less than 1 maund, 250

12th.—For the next best Sample of Upland, or green Seed Cotton, not less than 1 maund, 125

SECOND CLASS,—Or Premiums for Large Quantities.

SUGAR.

1st.—Rupees 40 per maund, for the first quality of Raw Sugar, the Sample to be not less than 50, or more than 100 maunds.

2nd.—Rupees 20 per maund, for the second best quality of Raw Sugar, the Sample to be not less than 50, or more than 100 maunds.

SILK.

3rd.—Rupees 40 per seer, for the best Silk, the Sample to be not less than 20 or more than 40 seers.

4th.—Rupees 25 per seer, for the next best Silk, the Sample to be not less than 20 or more than 30 seers.

TOBACCO.

5th.—Rupees 40 per maund, for the finest quality of Tobacco, the Sample to be not less than 30 or more than 50 maunds.

6th.—Rupees 10 per maund, for the next best quality of Tobacco, the Sample to be not less than 30 or more than 50 maunds.

COTTON.

7th.—Rupees 40 per maund, for the best Sea Island or *black* Seed Cotton, the Sample to be not less than 30, or more than 50 maunds.

8th.—Rupees 20 per maund, for the next best Sea Island or *black* Seed Cotton, the Sample to be not less than 30, or more than 50 maunds.

9th.—Rupees 40 per maund, for the best *green* Seed, or Upland Cotton, the Sample to be not less than 30, or more than 50 maunds.

10th.—Rupees 20 per maund, for the next best *green* Seed, or Upland Cotton, the Sample to be not less than 30, or more than 50 maunds.

CONDITIONS.

1st.—The articles exhibited by the Candidates for Premiums must be the produce of the Bengal Presidency.

2nd.—The competition will be open to all persons whatever, whether Natives or Europeans, Zemindars or Ryots.

3rd.—The articles must not be culled or selected from larger quantities, but be *bond fide*, the whole produce of the land on which they are grown.

4th.—All candidates for premiums must deliver, along with their specimens, statements of the place where the article was grown, quality of the land, nature of the soil, mode of cultivation, and of every cost, including delivery in Calcutta. And the Society shall be at liberty to call for further information before awarding the premiums, and to withhold them unless the information required be given.

5th.—The candidates must be at the expense of warehousing the more bulky articles in places convenient for inspection.

6th.—The fine samples to which the first class of premiums are awarded, shall be the property of the Society; the unsuccessful specimens shall be returned to the owner.

7th.—Successful candidates for the second class of premiums shall, previously to receiving the same, deliver to the Secretary of the Society such a quantity of each article as shall be sufficient to form a package fit for shipment; the rest of the article shall be returned to the owner.

8th.—The candidates for premiums must affix to their specimens a number or mark, and must forward to the Secretary a sealed letter, containing a similar number or mark, together with the name

and address of the candidate ; which letter shall not be opened till after adjudication, and thus prevent the suspicion of any bias or prejudice.

9th.—When two or more samples appear to be of equal quality, the premium will be awarded to the sample which appears to have been produced at the least cost.

10th.—All candidates for premiums must have their samples ready for inspection on or before the First of May 1832, and the premiums will be distributed on the First of June following.

C. K. ROBISON,

Secy. Agr. and Hort. Society.

The site selected for the Farm, (which amounted to nearly five hundred beegahs,) was at Akra, a place distant several miles from Calcutta. Active operations commenced on the 14th Oct. 1830, and were vigorously prosecuted until June 1833, about which time the lease expired, and the Society did not deem it any longer necessary to keep up the establishment, the Funds for its support of course ceasing with its existence. In June 1830, considerable quantities of Upland Georgia, Sea-Island, and Demerara Cotton Seed, together with a saw-gin for cleaning cotton, all which had been forwarded from England by the Honorable Court of Directors, were made over to the Society by the Supreme Government, as well as some interesting extracts* from Capt. Basil Hall's Travels, bearing on the mode of cultivating cotton and other American articles. A quantity of Cotton Seed from the newly acquired territories of the Texas-serim Provinces, was also sent by Government to the Society, for distribution.

The American Cotton Seed was most extensively distributed, but failed in vegetating in almost every instance in which it was sown, a disappointment to be attributed, in a great measure, to the rottenness of the seed from exposure for two months, in the season of the rains, in a low damp cellar of the Import Warehouse, and at the Government Store-rooms at Cooley Bazar, before being sent to the Society.

Another consignment reached Calcutta in 1831, and was distributed with better success.

At the August Meeting of the Society in 1832, the first information was received relative to the result of these trials, and the con-

* These have been published in vol. 2, Society's Transactions.

sequent capabilities of the soil of India, for the production of Foreign Cotton. One report was from Cuttack, and concerned the growth of Bourbon Cotton, which was stated to have length of staple and silky texture, and the interest generally which at this time appears to have been awakened on the part of the Society, may be judged of by the fact that in the 2nd Vol. of the Transactions containing eighty-two communications, no fewer than 26 are on the subject of cotton alone. Among these are reports by Mr. Willis, a practical Cotton Merchant, on the produce of Pernambuco Seed, grown by Mr. Hastie, near Calcutta, wherein the former gentleman estimates the value of the sample within a penny a pound of the Brazilian grown cotton then in the Liverpool market. The real Pernambuco being $7\frac{1}{2}d.$ and the "Bengal Pernambuco" $6\frac{1}{2}d.$ the pound.

From Upper Hindostan, Mr. Huggins states that the produce of the plants from the American seed was much more abundant than any of the descriptions of cotton he has seen in the country, the pods more than double the size, and the quality of the cotton, of which he sent a sample, he desired should speak for itself.

From Tavoy, the Commissioner writes to the Secretary of the Society under date Moulmein, June 5th, 1833, of the Pernambuco seed sown by him in that Province, that it is much valued by the Tavoyers who re-planted every seed that could be collected. The people prize it on account of the length of staple, the facility in separating the seed from the Cotton, and the advantage it possesses in being a strong and hardy plant, and perennial. At a meeting on the 18th April, 1833, Mr. James Kyd presented a sample of Sea Island Cotton grown on Saugor Island, from imported American Seed. After careful inspection by the Committee, it was pronounced to be the best specimen of the growth of India that had, as yet, been submitted to the Society, and the value set on it was from 1s. to 1s. 2d. per lb. which at the time was nearly three times the value of the indigenous Bengal Cotton.

While these accounts were coming in from distant places, the Society was devoting the greatest attention to the propagation of the foreign seed at its farm at Akra, and the returns of the year 1832-33, show a produce of *forty-three hundred lbs. of Cotton Wool, and one hundred and twenty-eight lbs. of seed.*

From the fertile arinaceous tracts along the line of the Delhi Canals, the most satisfactory report was received. Major Colvin, to whom the distribution of the Upland Georgia and Sea Island

seeds was confided, writes in August, 1834, that the quality of the Upland Georgia sown by him along the line of the Delhi Canal, is infinitely superior to the common country kinds.

The advantages attending the introduction of this new and superior culture cannot be better adduced than by anticipating, by a period of three years or so, the progress of events, and placing in juxtaposition with this first report of Colonel Colvin's, the labour of the same gentleman, in 1837, when, at the ordinary monthly meeting of the Society held in February, he presented a large bag containing upwards of 80 lbs. of Upland Georgia Cotton, which he had brought with him from the canal villages, the re-production of several successive crops derived from the seed before alluded to. As many as 100 villages along the line of the canals had been induced to adopt the cultivation of this superior Cotton, and in 1836 seed sufficient to plant about 150 acres of land had been distributed. Col. Colvin stated that the villagers were most anxious to obtain further supplies of seed.

The formal report on the quality of this cotton made by two practised members of the Society (Messrs. Speir and Willis) mentions the greatest part to be of considerably longer staple than our best native Cotton; and *equal to the American in length and in fineness*, but lessened a little in strength.

Mr. Willis offered his opinion under great disadvantages, being left to find out the origin and general history of the samples forwarded to him;—his practical knowledge, however, enabled him to pronounce it "Upland Georgia, inferior to the best and better description of North American Upland Georgia." His general premises accorded remarkably in the opinion given by Mr. Speir, and he stated it as his opinion that it would sell for 20 or 30 per cent. more in the English market than the cottons common to the Upper Provinces of India.

For his unremitting exertions in the improvement of this great staple, the Society, to mark its sense of approbation, was pleased to create Colonel Colvin an Honorary Member of the Institution, and shortly afterwards, this officer sailed for England.

To resume the thread of the narrative from the close of the year 1834;—I find that on 7th July, 1835, a communication was read at the Society's meeting on that day from Messrs. Willis and Earle, of Calcutta, containing an account of sales on the consignment of five

APPENDIX.

screwed bales and four hand-compressed bags of sundry kinds of cotton wool, the produce of the Akra farm, which had been shipped by them to the house of Messrs. Daniel and Thomas Willis of Liverpool.

These samples had been dispatched from Calcutta in July, 1833, and were obtained from imported Upland Georgia seed sown in 1831, also Bourbon seed sown in 1829, Sea Island seed sown in 1831, and Upland Georgia *one year in descent* from the imported seed. The account of sale is dated, 31st March, 1834.

At the time this cotton was shipped it was assumed by the Society that it would bring in the English Market, more or less 7*d.* per lb., and it is satisfactory, or to use the expression of Messrs. Willis and Earle, "pleasing to find, that according to the degree of its quality it has sold, during the time when the value of cotton was pretty stationary, in the early part of the year 1834, at from 6½*d.* to 7½*d.* per lb., averaging about 7*d.* per lb. Since the period when this was sold, cotton has generally greatly risen in England, and this cotton would now be worth there at least 9*d.* per lb."

On receiving this gratifying intelligence the reserved consignment, which had been lying in a cellar, in screwed bales, for nearly four years, corresponding in quantity to that sent to Liverpool, was shipped by Messrs. Willis and Earle, on the 17th October, at the request of the Agricultural and Horticultural Society, and forwarded to the Court of Directors of the Honorable India Company, from whom the Society has received the following report.

AKRA GROWN COTTON.

Report upon Sample bales sent to the Court of Directors by the Agricultural Society of India.

Revenue Department.

No. 3 of 1837.

Our Governor General of the Presidency of Fort William in Bengal.

(Extract.)

We have submitted to competent judges the samples of Cotton, Cotton Twist, and Cotton Cloth, referred to in the letter from the Secretary to the Society, dated the 19th October, 1835 ;—and the following is their report on the same.

APPENDIX.

Cotton Wool.

<i>Description in Invoice.</i>	<i>Quality ascertained in London.</i>
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Cleaned by saw-gin.</div> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <div style="margin-bottom: 10px;">No. 1.—From Upland Georgia seed, gathered in the spring of 1832.</div> <div>No. 2.—Ditto, 1832, 1833.</div> </div> </div>	<div style="margin-bottom: 10px;">Very middling, clean, but poor uneven staple, slightly injured in cleaning; brownish colour, esti- mated value $7\frac{1}{2}d.$ per lb.</div> <div>Good, fair, clean and bright; more even in staple, $9d.$ per lb.</div>
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">By churka.</div> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <div style="margin-bottom: 10px;">No. 3.—Do. do.</div> <div>No. 4.—Do. do.</div> </div> </div>	<div style="margin-bottom: 10px;">Not so clean,—$8\frac{1}{2}d.$ per lb.</div> <div>Fair, uneven staple, a little leaf remains; rather high colour, $8d.$ per lb.</div>
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">By saw-gin</div> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <div style="margin-bottom: 10px;">No. 6.—Bour- bon Seed 1831</div> <div>1832.</div> </div> </div>	<div style="margin-bottom: 10px;">Very middling, tolerably clean and good colour, much injured in staple, $6\frac{1}{2}d.$ per lb. (The saw-gin is unsuitable to this kind of cotton.)</div>
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">By churka.</div> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <div style="margin-bottom: 10px;">No. 8.—Sea Is- land, 1832, 1833.</div> </div> </div>	<div style="margin-bottom: 10px;">Fair, fine, but uneven staple; a little leaf and much stained. Had this growth been well got up and free from stain, it would have been worth about $12d.$ per lb. (The saw-gin is not used for Sea Island Cotton in North Ame- rica.)</div>
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">By churka.</div> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <div style="margin-bottom: 10px;">No. 9.—Upland Georgia, 1832, 1833, from accli- mated seed at Akra, being one year in descent from the imported seed.</div> </div> </div>	<div style="margin-bottom: 10px;">Very middling; rather fine but short and uneven staple; tolera- bly clean; and rather high colour, $8d.$ per lb.</div> <div style="margin-bottom: 10px;">Prices in England, June 1836, Sea Island $23d.$ to $25d.$ per lb.</div> <div style="margin-bottom: 10px;">Bourbon,—none.</div> <div style="margin-bottom: 10px;">Upland Georgia —$10d.$ to $11d.$</div> <div>Surat,—$6d.$ to $7\frac{1}{2}d.$</div>

When the letter of Messrs. Willis and Earle to the Society was read announcing the result of sales at Liverpool, the President took the opportunity of drawing the attention of the meeting to the great importance of securing and distributing fresh supplies of Foreign Cotton Seed;—and, from the trials made, and results obtained, it was declared, that little doubt could be entertained of the success

that would attend the introduction of a superior description of cotton seed into India.

The sum of 1000 rupees (£100) which had been for some time in the hands of Messrs. Willis and Earle for the purpose of procuring North American seeds direct, was ordered to remain appropriated to this object, and it was unanimously resolved, that in addition, a further sum of 1000 rupees should be set aside for the special purpose of insuring an immediate supply.

In September 1835, Mr. Patrick, superintendent of the Fort Glo'ster Cotton Mills, writes as follows,—“ *Accompanying are 24 bundles (five pounds each) of twist, spun from the cotton grown at Akra farm under the superintendence of the Agricultural and Horticultural Society;—also one piece of cloth (10 yards) made from the twist spun and wove by the power loom; and one piece (20 yards) made by the native hand loom.*” “ *This cotton I have carefully watched through the various stages of cleaning, carding, roving, spinning, &c. and have no hesitation in characterising it as equal to the very best Upland Georgia Cotton; its staple is fully as long, and I would say stronger and better adapted for mule spinning than any I have imported direct from America.*”

“ *My own opinion with regard to the cultivation of Up'land Georgia cotton in India, judging from what I have seen of it when tried under great disadvantages, is, that if judiciously prosecuted, it would ultimately be crowned with the fullest success.*”

At a general meeting in November 1835, that is, two months after the last grant, a further sum of 500 rupees was voted for the purchase of cotton seeds.

At the opening meeting of the Society in the year 1836, the importance of taking advantage of every opportunity to supply the constant demands made on the Society from all quarters for cotton seed, was submitted to the members, and the propriety of soliciting the services of Mr. Patrick, then on the eve of departure for England, was considered. Mr. Patrick, who was present, at once offered his services to aid in promoting the Society's views, and it was resolved to place at his disposal the sum of 1000 Rs. (£100) in addition to the sum of 1500 Rs. already set apart for a similar purpose.

On this occasion, His Excellency Sir Henry Fane, who was present, alluding to the difficulty which the Society had hitherto experienced in procuring seed direct from America, suggested the

idea of writing to his Britannic Majesty's Consul at New York or Charlestown, South Carolina, soliciting him to aid in furtherance of the Society's wishes,—and a letter to this gentleman was ordered to be drafted accordingly.

At the following monthly meeting the Honorable Sir Edward Ryan, the President of this Society, recalled the attention of the members to the discussion, at the former meeting regarding the importance of establishing a *regular* and *direct* channel through which the Society might confidently look forward for a supply of cotton seed, and with special reference to the suggestion made by His Excellency Sir H. Fane, the meeting unanimously resolved on requesting Sir H. Fane to write to the President of the Board of Trade, to express to the Right Honorable Poulet Thompson, the great anxiety felt by the Society to have a direct channel opened in order to secure a regular supply of fresh cotton seed from America,—and that a letter of credit be drawn up to the amount of 1000 Rs., for the *annual* provision of seed, *exclusive of what had previously been appropriated*. The whole amount of this last grant, was ordered to be invested in *Upland Georgia*.

It was further resolved to have recourse to Egypt for a supply of seed,—and 200 Rs. (£20) was set apart for this purpose.

On the 9th March, that is to say, at the meeting following the one last alluded to, an intimation was made to the Society, by His Excellency Sir H. Fane, that he had, as requested, despatched a letter to the Right Honorable P. Thompson, President of the Board of Trade, soliciting that gentleman to influence consignments of cotton seed from America in a regular series of supplies.

At this meeting, too, Mr. Piddington, a very zealous member of the Society, presented a paper on the soils suitable for the cultivation of Cotton and other articles, accompanied by samples of each variety, in which the importance of duly attending to this subject was pointed out, in order that the capitalist might know where best to commence his labours.

It may not be out of place here to record a striking fact related by Captain Dixon, Resident at Mhairwarra in Rajpootana. After alluding to the rottenness of some Pernambuco Cotton seed which had been received by him, he adds, “the noise in this country, caused by our *sinking so many wells, forming numerous tanks, and new villages, besides two new towns*, has caused a marked sensation

amongst our neighbours in Mhairwarra and Meywar; hundreds of cultivators, bankers, merchants, dealers, and the various castes who accompany a crowd, are coming to settle in this district."

On 16th October 1836, Captain Dixon, alluding to the Foreign Cotton seed in his neighbourhood, writes that the Cotton is of a very superior quality, and compared with the country kind, it is as *silk to wool*.

About this time, intelligence was received of an interesting kind from the Political Agent at Loodiana, stating that there was a great desire expressed by the people of the Punjaub to be supplied with *foreign cotton* seed, and that in reference to seed formerly sent to him, the Cotton appeared to thrive better than the indigenous kind, which was not very generally cultivated. At Ferozepore, now the new military station, he saw several plants of the American Cotton growing there luxuriantly in a garden, and on inquiry, it was found that the seeds had been introduced by a gardener, from the banks of the Jumna, who had procured them, it was supposed, from seed sent by Colonel Dunlop.

A practical illustration of the wretched system of husbandry which is pursued all over India, is found in the description given to the Society by Mr. Jones, who, in a letter from Jaunpore, one of the richest Agricultural Districts in Upper Hindostan, draws the attention of the Society to the hopelessness of improving the cotton cultivation in that part of the country, as long as the mass of population continued to press for the actual means of subsistence on the unaided and over-wrought powers of the soil. "Thus" writes Mr. Jones, "when cotton is sown, pulse, Indian corn and common peas accompany it, when each is allowed to displace that which arrives first at maturity; the cotton, being the latest, is at length, (after being choked for five or six months) allowed undisturbed possession of an exhausted soil, and produces in return, pods about the size of a hazel-nut."

After many vexatious disappointments experienced by the Society in endeavouring to procure a supply of American Cotton seed direct, a consignment of two hundred bushels reached Calcutta,—and, on the 24th September 1836, in Committee, it was agreed that this quantity should be distributed to the several Branch Agricultural Societies throughout Hindostan and the Peninsula of India. Moreover, a cask of Egyptian Cotton seed was at this time received

from Mr. Waghorn, after the observance by that gentleman, of the greatest caution and secresy and at a great expence, in getting it out of the country.

About this period, the Society addressed a letter to the Government of India for a remission of postage on all parcels of cotton and other agricultural seeds, as the exertions of the Society were avowedly directed towards benefitting the resources of India, and consequently the revenue of the state. Indeed it may with truth be said that the Society was and is still performing many of the essential functions of a State Board of Agriculture. The request, after much difficulty, has to a certain extent, been complied with by the Indian Government, "on a special application being made to them in every instance wherein the Society desires to transmit parcels of seeds to the interior of the country, provided the supplies of seed are intended solely for public distribution."

At this time a valuable consignment, two hundred pounds weight, of American Cotton seed was received from Mr. Crooke, and in the space of four months the whole was distributed to about forty persons.

In November, a consignment consisting of 87 bushels of Upland Georgia, 78 bushels of New Orleans, and 30 bushels of Sea Island Cotton seed, amounting in cost to the sum of £57, reached Calcutta from America, through the house of Messrs. Gisborne and Co. and measures were immediately undertaken for judiciously distributing it.

Messrs. Jamieson and Co. of Calcutta, at this time, presented to the Society four bags of Upland Georgia seed received from a correspondent at Glasgow.

At the General Meeting of May 1837, an announcement was made to the members by the President, that he had received through Sir Henry Fane, a letter from the Right Honorable Poulet Thompson, in reply to the one addressed to him on the subject of obtaining Cotton seed for India, in which the importance of the subject is duly recognized by Mr. Thompson, and the Society was led shortly to expect a first despatch by overland couriers, and also others direct from Boston and New York. The Society passed a vote of thanks to Mr. Thompson for the promises held out. But two years have elapsed since this letter was received and no Cotton seed has ever reached the Society from this quarter.

Of the success of Egyptian Cotton seed, sown at Nunnore, Shahabad, in the province of Behar, we have the testimony of Mr. George Leyburn, who is settled there as a planter. The communication made by this gentleman to the Society was read at the meeting on the 9th August 1837, and it stated that the seed was sown at the commencement of the rains (July), of the previous year, in a good loamy soil, flowered partially in October, and gave some small produce in December and January ;—in March it flowered and gave produce till the end of May ; the plants were most luxuriant, and from four to six feet in height. The produce from about 200 plants was upwards of nine factory seers of cotton, and seventeen seers of cleaned seed. Mr. Leyburn forwarded this cotton to the Society, and mentioned that besides its superiority in staple, the plants of the Egyptian cotton yield much more cotton in proportion to seed than the indigenous plants.

A few days after this communication was made, the cotton wool was submitted for report to the Cotton Committee, who stated that “the staple was good ;”—the wool however was stained in colour by too much moisture at the time of ripening, and by one member it was considered that it “would work to much waste by the spinner.”

From the Deyra valley, at the foot of the Himalaya mountains, a tract of country, I may mention, where the application of capital is yielding immense returns in sugar,—Lieutenant Kirke writes for Egyptian Cotton seed, stating that he will readily pay any expence, as he is convinced it is the cotton that will thrive best in “the valley” (Dhoon) though nothing could be finer than the three acres of Upland Georgia that he had growing in his garden in a poor stoney soil.

Of the capability of the rich and almost virgin soil of the Honorable Company’s newly acquired districts on the Tenasserim Coast, nothing has yet been said, but from the few trials that have been made there of the Pernambuco Cotton seed there is every reason for supposing that the soil is well adapted for this culture as well as for that of the Seychelles and Sea Island kinds. Two most valuable papers on the capabilities, topography, and great natural resources of these provinces and their admirable adaptation for English colonization, are to be found in the 6th volume, just published, of our Transactions.

I now arrive at the period when the circumstances of the Institution once more enabled the members to stimulate industry by the encouragement of prizes. With the limited means at the disposal of a body whose dependance rests on voluntary fellowship, no great offer of intrinsic value can be expected, nor can the command of capital for the purpose of efficiently testing the fitness of the various soils of the Indian empire for the production of the finer cottons, on a scale commensurate with the importance of the measure, be found. The entire contribution which the Society receives from the State is £260 a year, and for all other resources for keeping up their efficiency, they are solely dependent on themselves.

Still as far as the means of the Society afford, they have been freely offered, and the determinateness, so to express it, with which the introduction of the finer varieties of cotton seed has been pursued is an earnest to your Chamber and the public generally how, assured the Society feel that perseverance is all that is required to crown the enterprise with success.

By such a display of medallion prizes as you will perceive to be here offered, the Society must only be considered as directing public attention to the great object in view; for the distinction of a medal, honorable as it is, can by no means be regarded as a just or sufficient reward towards an individual who renders to the Government of this enormous empire the benefits of an improved cultivation in cotton.

The difficulties into which the Institution was thrown by the failure of the Agents in 1833, have prevented the renewal of the offers of *money premiums* on this occasion, yet the increase in the number of competitors in this year (1839) over last year, leads me to consider that the estimate set on the value of the medals of the Society is fast enhancing in public opinion. The schedule is the following :

The following prizes are offered to the Producers of the best Samples of the undermentioned Staples of the Bengal Presidency, agreeably to the resolution of the Society, passed at a Meeting held on the 14th November last.

SUGAR.

1st.—For the best Sample of *unrefined* Sugar,
not less than 2 maunds, *The Gold Medal.*

For the second best Sample of *unrefined* Sugar
as above, *The Silver Medal.*

SILK.

- 2nd.—For the best Sample of Silk, not less than
2 seers, *The Gold Medal.*
For the second best Sample of Silk, as above, . . . *The Silver Medal.*

COTTON.

- 3rd.—For the best Sample of Cotton, raised from
foreign seed, not less than 2 maunds, *The Gold Medal.*
For the second best Sample of Cotton, raised
from foreign seed, as above, *The Silver Medal.*

TOBACCO.

- 4th.—For the best Sample of Tobacco, reared
from foreign seed, not less than one maund, . . . *The Gold Medal.*
For the second best Sample of Tobacco, reared
from foreign seed, as above, *The Silver Medal.*

CONDITIONS.

1st.—The articles exhibited by Candidates for Medals, must be the produce of the Bengal and North Western Provinces.

2nd.—The competition will be open to all persons whatever, without distinction.

3rd.—The articles must not be garbled but bona fide the average produce of the land on which they are grown, or of the manufacture.

4th.—All candidates for Medals must deliver with their specimens, statement of the places at which the articles were produced, the quality or nature of the soil and of the mode of cultivation and manufacture, and the cost of production.

5th.—A moiety of the specimens which shall be declared entitled to the *Gold Medals*, shall be the property of the Society, the remainder will be returned to the candidates.

6th.—Candidates are requested to affix to their specimens, a number or mark, and to accompany them with a sealed letter, and to mark the letter addressed to the Secretary with the words "Competition Letter," which letter will remain unopened till after adjudication.

7th.—When two or more Samples shall be considered to be of equal quality, the Medal will be awarded to the Sample which may appear to have been raised at the least cost and with reference also to the greatest quantity produced upon a given area.

8th.—All candidates are expected to have their specimens in the possession of the Secretary of the Society on or before the 1st May, 1839.

It was also resolved that the same prizes should be awarded on the same conditions for the year 1840.

HENRY H. SPRY, M. D. *Secretary.*

*Agricultural Society's Office,
Town Hall, Calcutta, Nov. 20, 1838.*

As the distribution of cotton seed continued, it was to be expected that reports of a more extensive character would come in, and so it has proved. Thus in the past year a paper of a most useful kind, because it embraces a more general consideration of the question than any of the foregoing, was received from Mr. Claude Hamilton at Culpee in Bundelkund, in which the writer favours us with the result of his experience, which will no doubt be acceptable. Mr. Hamilton states that it appeared to him, from actual experience, that the best cotton is grown in the North Western Provinces, in soils of which limestone forms a considerable ingredient; for instance, the cotton produced on the banks of the Jumna, the soil of which contains a great deal of "Kunkur" or nodular limestone, is much superior to the cotton produced on the banks of the Ganges where the soil is sandy; and the whole supply of indigenous cotton is, at present, produced in the Provinces west of Mirzapore.

The Cotton of Bundelkund is the best grown on this side of India, and as it is the principal product, the people are well acquainted with the cultivation and collection of it. The cotton being collected from the plant and not allowed to fall on the ground, as in other districts, is in general free from leaf and stain, and Mr. Hamilton considered that if the Society intends going on with its attempts to introduce the Foreign Cotton Seed, that it can only be done by obtaining the assistance of Government, land-rent being high, and the best soils for cotton to be found only at some distance from the European Station, so that little can be expected from European Superintendence, while an experimental garden or plantation is not likely to answer. Were the Government to authorise the collectors to remit half the claim for rent, on all lands *on which a fair crop of Foreign Cotton was raised*, Mr. Hamilton thinks that the cultivators (royts) would be induced to give their attention to the cultivation, and as the quantity of land required at first would not be great, the experiment might be tried on Khas farms, which are those that are managed by the hands of Government *itself*.

The sowings should commence as soon as the rains set in. The seed to be ordered in time for it to reach Bundelkund not later than the middle of April, &c.

The collectors of Bundelkund, Cawnpore and Etawah might, Mr. Hamilton thinks, in conjunction with other eligible individuals, meet annually to inspect the produce and distribute any premiums.

The grounds for Mr. Hamilton's preferring his views to the Society are, that it should intercede its influence with Government in procuring the adoption of the plan here propounded. Mr. Hamilton states, during the past season an attempt was made by a gentleman of the name of Dearman, to introduce into the District Georgia and Sea Island Cotton, that he had imported quantities of the seed for the purpose, and took lands in the neighbourhood, which were irrigated and sown in April and May last: but owing to the extreme drought, the crop, in common with the rest, which led to the fearful famine, was almost spoilt, and although the quality of the cotton procured was very fine, the quantity was so small as to leave a heavy loss on the speculation;—discouraged by this bad success, Mr. Dearman has given up the speculation and requested Mr. Hamilton to dispose of the seed. This Mr. Hamilton tried to do by inducing some of the cultivators in the neighbourhood to sow it, but without success; on which he addressed a letter to the collector of the District. The reply which was sent back, was to the following purport: that he (the collector) had called upon the different subordinate local native Government collectors (Tuhseeldars) to report if there were any land-owners (zemindars) willing to take the seed for the purpose of making the experiment, or rather of finding out if the soil of Bundelkund was suited for its growth, and that all declined to have any thing to do with it on the ground that their fathers and grandfathers had never heard of the seed, and consequently had never grown any of it, and therefore what use was it to them. In consequence of this the collector states that he could not order them to sow the seed, but told them they were great fools for missing so good an opportunity of introducing a superior kind of cotton, and he proposed that if *the Society would provide him with seeds and funds for land-rent, labour, &c.*, he should be happy to give up a little of his time, and a good deal of his attention to the cultivation of this cotton. The Agricultural and Horticultural Society feel that as a public body, unconnected with the Government of the country,

it cannot appropriate any portion of its funds in improving the revenue of the state, by supplying money rents for land to insure the introduction of new and improved cultures, and that all that it can possibly do is to distribute, to the utmost of its power, seeds to all who apply. This is liberally done, and by a rule which has been for a long time in force, every person, whether he be a member or not, is able to obtain a supply of *agricultural* seeds of all kinds gratis. The bounty which Mr. Hamilton thus suggests should be held out by the state to encourage beginners is one in every respect deserving of attention, and one which would, if adopted, there is little doubt, be attended with beneficial results.

At the meeting of July 1838, the Cotton Committee brought up a report upon sundry samples of Raw Cotton, the produce of *Delhi, Allahabad, Meerut, Beerbhoom, Cuttack, Dacca, Cossipore, (Calcutta,) Soonderbunds, Hazareebaugh, Arracan and Singapore.*

Without going minutely into the particulars of each sample it will be sufficient to embody the leading facts recorded in the Report.

The samples of Upland Georgian Cotton grown by G. H. Smith, Esq. at Delhi, in 1837, were in the opinion of the Committee, very fair specimens of Upland Georgia; but not equal to the produce of North America. This was thought to have arisen from the age of the seed, and from the difficulty of ascertaining the proper season for sowing this new description of Cotton in India.

A sample of the same kind of Cotton *grown* in 1838, was also forwarded, but Mr. Smith did not state whether from the same plants, as the former year, cut down or, from their seed; a point of importance, as in the opinion of the Committee it is a *better* sample than that of 1837. The first year's seed was old, and probably planted out of season; that of the second year's produce was either the spontaneous crop which came naturally into season from the old stock, or the produce of fresh seed, planted at a proper time:—and the improvement in the second year's produce is a fact also of importance as tending to remove an impression entertained by some that the American Cotton deteriorates when sown in the Indian soil.

Again, samples sent up from Singapore, augurs favorably, the Committee think, of that Island, for the growth of the Sea Island Cotton.

A small bale of Upland Georgia cotton, the *second* crop from plants grown by Dr. C. Huffnagle, an American gentleman, residing at Cossipore, in the Suburbs of Calcutta, from seed imported by the Society in 1836, was pronounced by the Committee, without quali-

fication, as one of the *finest specimens that has been submitted to the Society*, and as the grower presented a goodly sample bale, the Committee were of opinion, in reference to the discretion given them by the Society, that it should have the benefit of the judgment of experienced brokers in England, and accordingly it was sent to the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain, with a copy of Dr. Hufnagle's letter. To this dispatch no reply has yet been received, but it may be daily expected.

The Committee remark this as the second example in the present Report of the *second* year's crop being better than the first, thereby leaving good ground for hope, that under proper management, the Upland Georgia Cotton will become a valuable staple in India.

The sample of Peruvian Cotton grown by the late Mr. G. Prinsep in the Soonderbunds, the Committee declared to be decidedly a superior article, the staple long and strong, though a little harsh. The Committee regard this as a very fine description of Cotton, and would recommend that it be tried upon a large scale.

The sample of Cotton from Hazareebaugh merits special attention for three reasons.

1st.—Because it has been grown by a highly intelligent *native* gentleman.

2nd.—Because it is the *first* specimen of foreign Cotton grown by a *native* gentleman.

3rd.—Because its quality is so superior as to have led the Committee to suppose it to be the produce of "*Sea Island*" seed, whereas, it is that of Egyptian, and estimated by them to be worth in England from 1s. 4d. to 1s. 6d. per lb.

But of all efforts at introducing the American Cotton into India those of Colonel Skinner at Hansi have been the most extensive. The figured statements of cost and production, which have been furnished by the Colonel, and are here given, are the most interesting which the Society possesses;—and it will be seen, that notwithstanding the result is derived from the first year's sowing, and that the Cotton was sold in the Calcutta markets under the most unfavorable circumstances, for foreign cotton has not acquired notoriety sufficient in India to admit of its being raised to a fair commercial value, the object of the interested few being to keep down colonial prices as much as possible, yet the gain of a trifle is shown.

Since my assumption of the Secretarial office, from the commencement of the present year, I have been favoured with a chest containing about one hundred pounds weight of Egyptian Cotton seed, and two bags about two bushels, of Malta Cotton seed, which is said to produce a red description of wool, of a permanent colour. Dr. Smith, at Hidgelee, mouth of the Hooghly, on two occasions, has offered minute specimens of cotton wool, the produce of Seychelles seed, the staple of which was pronounced to be very long and silky.

Mr. Piddington has likewise presented, a second time, to the museum, varieties of soil in which Cotton chiefly has been grown, procured from the Mauritius, Singapore, Bundelkund, and America.

The Cotton Committee have allotted 500 rupees, for the purchase of the best sorts of indigenous Indian Cotton seeds for distribution in Assam and elsewhere.

At the meeting in March last, a highly interesting note was presented by the late Mr. Ewart of this city, received by him, from his brother, who has been largely engaged in cotton spinning at Manchester, but is now residing at Bombay. The note states that Dr. Burn, at Kaira, has 50 or 60 trees of Bourbon cotton three years old, some of the produce of which was shown to Mr. Ewart, and that gentleman pronounced it excellent cotton,—*quite equal to the best New Orleans Cotton*. The seed from which these trees are grown, was taken from trees, which Dr. Burn found growing wild, but which were planted at Kaira 15 years ago by Mr. Gilder. The seed does not seem to have been deteriorated—it is black and smooth not like the Indian seed, to which the cotton adheres so firmly.

The late Mr. Ewart, in his note to me, conveying the above information, remarks, “My brother does not say what soil these plants are grown in, but I will ask him. It is curious such plants should have been neglected so long as 15 years,—but it is another proof of indolence and carelessness.”

On this occasion, I took the opportunity of mentioning to the Society that in connection with the foregoing communication, I had discovered amidst the papers lately published, on Cotton-Wool, Raw Silk, and Indigo, by the Court of Directors, the original report of the Bombay Government made in the year 1818, concerning the plantation of Mr. Gilder, Civil Surgeon, at Kaira in Guzeerat, adverted to by Mr. Ewart, which informs us that Mr. Gilder very judiciously selected a spot for his late experiment in the Eastern

districts, between the Subarmutty and the Myhee, where the greater portion of the soil is of a light sandy nature, as recommended by the cultivators in the Island of Bourbon, and where the general division of the country into enclosures protects the plants materially from the influence of the hot winds and from the ravages of cattle, which appear to be almost an insuperable objection to the cultivation of this shrub in the open country about Broach.

The seed was sown in rows, distant three feet from each other, preserving the same distance of plants in each row. The sowing commenced at the end of July 1816, after the first heavy rains were over. Indian millet (Bejaree) was sown by drill, in the usual manner, *at the same time with the Cotton.* The sowing of Indian corn with the cotton is recommended at the Isles of France and Bourbon, as affording protection to the tender plants from the heat of the sun until the grain be ripe, by which time they have acquired sufficient vigour. In the present case the Bejaree answered the purpose equally well; and *as the cotton plant yields no return the first season,* the crops of Bejaree ought to pay the expense of rent and cultivation. It will be seen that this remark applies particularly to the return statement made by Colonel Skinner.

At the subsequent meeting in May (last month) the late Mr. Ewart presented for the museum of the Society, two specimen parcels of this cotton wool, which was justly extolled. One parcel was freed of seed, the other contained the cotton as plucked from the tree. The cleaned cotton had been separated from the seed at Bombay by the American saw-gin, which was found to have cut the staple and thereby injured the quality of the cotton in the market. The cotton was valued at Bombay, at nearly double the price of the common country kind. "I propagated from some plants," writes Dr. Burn of Bombay, "which I found in the hedge rows near where Mr. Gilder's experimental cultivation had been conducted, and if it be Bourbon, it has become changed in some way, and is evidently well suited to be of value now. *This is my opinion after some seasons' observation, and I intend to go on increasing it.* It requires a dry sandy soil and no irrigation. Water or manure sends it all to leaves and branches. Slight elevated sand hills are the proper situations; sown at the beginning of the rains, *it yields almost no Cotton the first year, but is in full bearing the second and third year.* The bushes do best at 4 or 5 feet apart. I find fully 2-3rds of the produce is seed :

from each bush 60 rupees in weight of *Kuppas* (Cotton as it grows) 20 of which will be clean cotton."

After submitting this cotton to the Society, I read to the Meeting the highly important and interesting memorial of the President, Vice-President and Members of the Manchester Chamber of Commerce, and at its conclusion the President adverted to the increasing efforts of the Society during the last ten years to encourage by every possible means in its power the introduction of the superior cottons of North and South America, as well as of Egypt, Seychelles, Bourbon, and elsewhere. Capital the Society does not profess to command. The determined perseverance of the members in giving their utmost support to the introduction of seeds, is all they can do, but the zeal with which they continue to encourage the undertaking, will be received, it is hoped, as an earnest of their conviction that India can and will furnish ample supplies of the finest varieties of cotton, if money and skill be properly invested in the scheme.

It now only remains for me to add that the vote for this year, for the purchase of cotton seed, consists of 4,700 rupees, and that as no tidings of the despatch of any seed has ever been received from the President of the Board of Trade, the Society has determined to withdraw its confidence in the assurance which had been given it from that quarter, and to accept the polite offer of Dr. Huffnagle to obtain the Society's Annual investment of seeds, through another channel.

Not a week passes, but I send out large packages and parcels of the different varieties of foreign cotton seed to applicants scattered over the country, and doubt not that the proofs here furnished you, throughout this summary, of what has been done by the Agricultural and Horticultural Society of India, will afford satisfactory testimony of the capabilities of the soils of British India to furnish abundant returns on the application of capital in support of this important culture.

GENERAL RESULTS.

Two considerations result from the perusal of this summary.—

Firstly, The amount of practical benefit which has attended the unremitting labours of the Society for the last ten years in importing and distributing Foreign Cotton seed,—the changes, if any, which acclimation has wrought on seed reproduced in India,—the

condition of the experiments made at the Farm of the Society at Akra,—and

Secondly, that which concerns the future—the measures which are best calculated to promote the growth of the finer cottons,—the Provinces of the Empire into which the culture can be introduced with the best chance of success,—and the means which the Society possesses for prosecuting this great national work with efficiency.

The utility arising from the Society's efforts has been the accumulation of a mass of practical information, small in substance singly, but important and convincing collectively, as showing that, with the disadvantages which ignorance as to soils,—the best seasons of planting,—and the observance of strict rules of cotton husbandry occasion, the conviction comes home forcibly to the mind, that the Indian soil is, to an unlimited extent, in different Provinces, adequate to the growth of cottons that would command a position, in commercial value, far superior to that which the inferior annual of the country is now doing. The fact recorded, in the foregoing summary, in more than one instance, of seed producing *a better stapled article the second year* than the first, and the great practical support this truth derives from the communication of Mr. Ewart in Guzerat, must at once still every fear as to the cottons of America, if introduced into this country and treated with proper care, after the lapse of time, degenerating in quality. It has been seen that the first year's produce is rarely if ever worth much, whereas the second and third year's are the periods for profitable returns. The condition of the experiments made at the Farm of the Society at Akra are confirmatory of these views. The official Report of the Home Government shows plainly the Society's Cotton to have fetched a much higher place than that of the indigenous kind. The site however of this garden or farm, was in the midst of the swamps of the Soonderbunds,—a situation by no means the best for testing the efficiency of Indian soils for the cotton culture; and besides, when taken in hand by the Society was held by it only for three years. With regard to the measures best calculated to promote the growth of the finer cottons, a difference in opinion may probably exist.

The experience of those who have passed many years of their lives in Upper Hindustan is decidedly in favor of central India and the North Western Provinces, and every one knows that much of what is now exported of the best sorts of Indian Cotton is grown in the Western Provinces of Bombay and Madras.

There are some however who maintain that the soil of the provinces of Behar, Benares, and Bengal as well as Orissa, is capable of supporting cotton cultivation, and if the isolated specimens in the Society's possession, minute in quantity, but striking in appearance, be taken as a criterion, then there is no doubt that the Seychelles, Peruvian and Sea Island cotton will thrive abundantly and do well.

Out of all the varieties of seed which have been sown, there is no reason for believing that any of those precautions, so rigidly observed in attaining a fine produce by picking and choosing the finer seeds before sowing, has ever been pursued by experimentalists in India; but, too glad to obtain the foreign seed in any shape, they have indiscriminately thrown the whole into the ground, and to facilitate and nurture the rising plant have both watered and shaded it. Taking the experience of the west and those smaller spots celebrated for cotton cultivation as well as what the result of the past has furnished as a guide, it may be assumed that the Upland Georgia and Egyptian is the seed best calculated for introduction into the interior and Upland parts of India; while the Pernambuco, Peruvian, Seychelles, Bourbon and Sea Island may suit best along the line of coast. Another circumstance not less important than the foregoing in forming an estimate of the capabilities of the Indian soil, must also be attended to, and that is the poverty of the working farmer in this country, which is such that to procure food for himself and family, and at the same time meet the calls of the landlord and Government Collector, he is compelled to force the powers of his soil to the utmost extent, and, as is well known to those who have resided in the Provinces, to re-sow in the harvest-land of March seed that will ripen in October. Or, as we have seen recorded in the body of this summary, three different kinds of seed at once, the whole of which ripens irregularly, leaving the longest, which is usually either a cotton or sugar-cane, to ripen last, amidst the wretchedness of an impoverished soil—a system which if destructive to the proper development of the pods of the common annual herbaceous cotton plant of the country, must be immeasurably so to the success of the foreign perennial trees of which we seek the introduction.

To define the Provinces into which the culture can be introduced with the best chance of success would be, in Hindustan, to enumerate parts of Behar, the Dooab, especially the banks of the Jumna and the line of country through which the Delhi and Dooab canals run; Rohilkund, Bundelkund, and the rich and fertile valley

of the Nurbudda. Of the Western Provinces of the empire we have Guzerat,—the seaports of which, Surat and Boraoch have been celebrated as cotton ports from the time of Arrian downwards; the line of country extending along the Western Ghats to the Carnatic where some of the finest cotton, as at Salem and Tinnivelly, which India has ever produced, has been grown.

The last consideration, and one of vital importance, is the means which the Society possesses for prosecuting this national work with efficiency. The least attention to the economy of a single institution, such as the Agricultural and Horticultural Society of India, although consisting of five hundred persons, the largest ever associated in a body in India, is sufficient to show its total incompetency to embark on that enlarged and workman-like style of labour which shall at once develope the fitness of India to supply the cotton markets of the world, and render the mother-country independent of her foreign supply. The offer of a fitting bounty either by reducing the assessment on lands on which foreign cotton seed is grown, or by stimulating industry by larger grants, as prizes, properly belongs to the State whose revenues would be proportionably enhanced by such an enterprise, or to a body of capitalists anxious to reap a rich harvest of gain by so promising a speculation. All that the Society can do is, to the utmost extent in its power, to give its funds gratuitously to the support of this national culture, by continuing to introduce seed, and urge by every means at its disposal the adoption of the measure, the success of which, if pursued on a large and persistent scale, and such only does the magnitude of the stake merit, must lead to a successful and lasting issue.

I have the honor to be,

Sir,

Your's faithfully and truly,

(Signed) HENRY H. SPRY, M. D.

Secretary.

*Agricultural and Horticultural Society's Apartments,
Town Hall, Calcutta, June 10th, 1839.*

TRANSACTIONS.

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA.

I.—*Report on the Manufacture of Tea, and on the Extent and Produce of the Tea Plantations in Assam. By C. A. Bruce, Superintendant of Tea Culture.*

[Presented by the Tea Committee, and read at the Meeting of the Society on Wednesday, 14th August, 1839.]

I submit this report on our Assam Tea with much diffidence, on account of the troubles in which this frontier has been unfortunately involved. I have had something more than Tea to occupy my mind, and have consequently not been able to commit all my thoughts to paper at one time; this I hope will account for the rambling manner in which I have treated the subject. Such as my report is, I trust it will be found acceptable, as throwing some new light on a subject of no little importance to British India, and the British public generally. In drawing out this report, it gives me much pleasure to say, that our information and knowledge respecting Tea and Tea tracts are far more extensive than when I last wrote on this subject;—the number of tracts now known amounting to 120, some of them very extensive, both on the hills and in the plains. A reference to the accompanying map will shew, that a sufficiency of seeds and seedlings might be collected from these tracts

in the course of a few years to plant off the whole of Assam; and I feel convinced, from my different journeys over the country, that but a very small portion of the localities are as yet known.

Last year in going over one of the hills behind *Jaipore*, about 300 feet high, I came upon a Tea tract, which must have been two or three miles in length; in fact I did not see the end of it: the trees were in most parts as thick as they could grow, and the tea seeds (smaller than what I had seen before) fine and fresh, literally covered the ground: this was in the middle of November, and the trees had abundance of fruit and flower on them. One of the largest trees I found to be two cubits in circumference, and full forty cubits in height. At the foot of the hill I found another tract, and had time permitted me to explore those parts, there is no doubt but I should have found many of the Naga Hills covered with Tea. I have since been informed of two more tracts near this. In going along the foot of the Hills to the westward, I was informed that there was Tea at *Teweack*, or near it: this information came too late, for I had passed the place just a little to the east of the Dacca river, at a place called *Cheriedoo*, a small hill projecting out more than the rest on the plain to the northward, with the ruins of a brick temple on it; here I found Tea, and no doubt if there had been time to examine, I should have found many more tracts. I crossed the Dacca river at the old fort of *Ghergong*, and walked towards the Hills, and almost immediately came upon Tea. The place is called *Hauthoweak*. Here I remained a couple of days going about the country, and came upon no fewer than thirteen tracts. A Dewaniah who assisted me to hunt out these tracts, and who was well acquainted with the leaf, as he had been in the habit of drinking tea during his residence with the Singphoes, informed me that he had seen a large tract of Tea plants on the Naga mountains, a day's journey west of *Chiridoo*. I have no reason to doubt the veracity of this man; he offered to point out the place to me, or any of my men, if they would accompany him: but as the country belonged to

Raja Poorunda Sing, I could not examine it. I feel convinced the whole of the country is full of Tea.

Again, in going further to the south-west, just before I came to *Gabrew* hill, I found the small hills adjoining it, to the eastward, covered with Tea plants. The flowers of the Tea on these hills are of a pleasant delicate fragrance, unlike the smell of our other Tea plants; but the leaves and fruit appear the same. This would be a delightful place for the manufacture of Tea, as the country is well populated, has abundance of grain, and labour is cheap. There is a small stream called the *Jhangy* river, at a distance of two hours walk; it is navigable, I am informed, all the year round for small canoes, which could carry down the Tea, and the place is only one and a half day's journey from *Jorehaut*, the capital of Upper Assam. Southwest of *Gabrew Purbut* (about two days' journey) there is a village at the foot of the hill, inhabited by a race called Norahs; they are Shans, I believe, as they came from the eastward, where Tea abounds. I had long conversations with them, and the oldest man of the village, who was also the head of it, informed me, that when his father was a young man, he had emigrated with many others, and settled at *Tipum* opposite *Jaipore*, on account of the constant disturbances at *Munkum*; that they brought the Tea plant with them, and planted it on the *Tipum* hill, where it exists to this day; and that when he was about sixteen years of age, he was obliged to leave *Tipum*, on account of the wars and disturbances at that place, and take shelter at the village where he now resides. This man said he was now eighty years of age, and that his father died a very old man. How true this story is, I cannot say, and do not see what good it would do the old man to fabricate it. This was the only man I met with in my journeys about the country who could give any account of the Tea plant, with the exception of an Ahum, who declared to me that it was Sooka, or the first Kacharry raja of Assam, who brought the Tea plant from *Munkum*; he said it was written in his *Putty*, or history. The *Ahum-Putty* I have never been able to get hold of; but this

I know, that the information about the Tea plant pointed out by the old Norah man, as being on the *Tipum* hill, is true ; for I have cleared the tract where it grew thickest, about 300 yards by 300, running from the foot of the hill to the top. The old man told me his father cut the plant down every third year, that he might get the young leaves.

To the west of *Gabrew* I did not find any Tea ; but to the westward of the *Dhunseeree* river I found a species, though not the same as that we use. If the people on the west side of the *Dhunseeree* river were acquainted with the true leaf, I think Tea would be found. I planted it all along the route I went, which may lead to its eventual discovery ; but people should be sent to search for the plant who are really acquainted with it. I think a vast quantity of Tea would be brought to light, if this were done. A reference to the map will show how our tracts are distributed all over the country. How much Tea they would all produce if fully worked, I will not pretend to say, but in the course of this subject I will mention such matters relative to the tracts and the plants on them, that every one may make his own calculation. Until lately we had only two Chinese Black Tea makers. These men have twelve native assistants ; each Chinaman with six assistants can only superintend one locality, and the Tea leaves from the various other tracts, widely separated, must be brought to these two places for manufacture. The consequence is, that an additional number of labourers must always be employed to bring the leaves from so great a distance. The leaves suffer when brought in large quantities from a distance, as they soon begin to ferment ; and the labour of only preparing them so far in process, that they may not spoil by the mroing, is excessive. The men have often to work until very late to accomplish this. When labour falls so very heavy, and on so very few, it cannot be expected that it can be equally well executed, as if more had been employed. The leaves last gathered are also much larger than they ought to be, for want of being collected and manufactured earlier ; consequently the Tea is inferior in

quality. I mention this to shew the inconvenience and expense of having so few Tea makers.

The samples of Black Tea made by the twelve assistants having been approved of by the Tea Committee in Calcutta, it was my intention to have distributed the men amongst the different tracts; but the late disturbances on our frontier have prevented this arrangement, and I have been obliged to employ ten men in Assam (two others having gone to Calcutta in charge of Tea) at the tract called *Kahung*, which is becoming a very extensive and important Tea locality, so many others being near it, which can all be thrown into one. When we have a sufficient number of manufacturers, so that we can afford to have some at each tract, or garden, as they have in China, then we may hope to compete with that nation in cheapness of produce: nay, we might, and ought, to undersell them; for if each tract or garden had its own Tea maker and labourers, the collecting of the leaves would not perhaps occupy more than twelve days in each crop; after which the men might be discharged, or profitably employed on the Tea grounds. But now, for the want of a sufficient number of labourers and Tea makers, there is a constant gathering of leaves throughout the month; and as I said before, those gathered last can only make inferior Teas; besides the great loss by the leaves getting too old, and hereby unfit for being made into any Tea; and all this entirely for want of hands to pluck the leaves. It is true we have gained twelve Black Tea makers this year, in addition to the last; and twelve more native assistants have been appointed, who may be available next year to manufacture Tea independently, as they were learning the art all last year. We have also had an addition to our establishment of two Chinese Green Tea manufacturers, and twelve native assistants have been placed under them to learn; but what are these compared to the vast quantity of Tea, or the ground the Tea plants cover, or might be made to cover in three years?—but a drop of water in the ocean! We must go on at a much faster pace in the two great essentials—Tea manufacturers, and labourers,—in order

to have them available at each garden, when the leaves come into season.

If I were asked, when will this Tea experiment be in a sufficient state of forwardness, so as to be transferable to speculators? I would answer, when a sufficient number of native Tea manufacturers have been taught to prepare both the black and the green sort; and that under one hundred available Tea manufacturers, it would not be worth while for private speculators to take up the scheme on a large scale; on a small one it would be a different thing. In the course of two or three years we ought to have that number. Labourers must be introduced in the first instance to give a tone to the Assam Opium-eaters; but the great fear is that these latter would corrupt the new comers. If the cultivation of Tea were encouraged, and the poppy put a stop to in Assam, the Assamese would make a splendid set of Tea manufacturers and Tea cultivators.

In giving a statement of the number of Tea tracts, when I say that *Tingri*, or any other tract is so long and so broad, it must be understood, that space to that extent only has been cleared, being found to contain all the plants which grew thickly together; as it was not thought worth while at the commencement of these experiments to go to the expense of clearing any more of the forest for the sake of a few straggling plants. If these straggling plants were followed up, they would in all probability be found gradually becoming more numerous, until you found yourself in another tract as thick and as numerous as the one you left; and if the straggling plants of this new tract were traced, they would by degrees disappear until not one was to be seen. But if you only proceeded on through the jungles, it is ten to one that you would come upon a solitary Tea plant, a little further on you would meet with another; until you gradually found yourself in another new tract, as full of plants as the one you had left, growing absolutely so thick as to impede each other's growth. Thus I am convinced one might go on for miles from one tract into another. All my Tea tracts about *Tingri* and

Kahung are formed in this manner, with only a patch of jungle between them, which is not greater than what could be conveniently filled up by thinning those parts that have too many plants. At *Kahung* I have lately knocked three tracts into one, and I shall most probably have to continue doing the same until one tract shall be made of what now consists of a dozen. I have never seen the end of *Juggundoo's* Tea tract, nor yet *Kujudoo's* or *Ningrew's*. I feel confident that the two former run over the hills and join, or nearly join, some of our tracts in the *Muttack* country. Nor have I seen the end of *Kahung* tract, all about that part of the country being one vast succession of Tea from *Rungagurra* on the *Debrew*, to *Jaipore* on the *Buri Dehing*. It may be seen on inspecting the map how thickly the Tea localities are scattered;—those that are known, and they are but a small portion compared to those that are unknown. There is the *Namsong* tract on the *Naga* hills, the largest that has yet been seen, and the extent of which is not ascertained. The tracts on the *Gubind* hills are unknown; and this is likewise the case with *Haut Holah* and *Cheridoo*; so that there is a large field for improvement throughout, to say nothing of the *Singpho* tracts, which may be found to be one unbounded link to *Hookum*; and who knows but it crosses the Irrawaddy to China? Many Tea tracts I know have been cut down in ignorance by the natives, to make room for the rice field, for firewood, and fences. Many of these tracts have sprung up again, more vigorous than before. Witness that at *Ningrew*, where the natives say that every thing was cut down, and the land planted with rice, except on the high ground.

With respect to the Tea plant being most productive on high or low ground, I cannot well say, as all our tracts are on the plains; but from what little I have seen of the hill tracts, I should suppose they were not more productive. In China the hill tracts produce the *best* Teas, and they may do the same here. Almost all my tracts on the plains are nearly on the same level, I should think. *Nudwa* perhaps is a little higher than *Tingri*, and *Tingri* a little higher than *Ka-*

hung, but I believe they are equally productive; although if I leaned towards any side, with my limited experience, I should say that the low land, such as at *Kahung*, which is not so low as ever to be inundated by the strongest rise in the river, is the best. The plants seem to love and court moisture, not from stagnant pools but running streams. The *Kahung* tracts have the water in and around them; they are all in heavy tree-jungles, which makes it very expensive to clear them. An extent of 300 by 300 will cost from 200 to 300 rupees; i. e. according to the manner in which the miserable Opium-smoking Assamese work. This alone ought to point out the utility of introducing a superior race of labourers, who would not only work themselves, but encourage their women and children to do the same;—in plucking and sorting leaves they might be profitably turned to account for both parties. This I have not been able to instil into the heads of the Assamese, who will not permit their women to come into the Tea gardens. Indeed unless more labourers can be furnished, a large amount of Tea must not be looked for at present. Last season it was with the greatest difficulty that I could get a sufficient number of hands to gather the leaves. The plucking of the leaves may appear to many a very easy and light employment, but there are not a few of our coolies who would much rather be employed on any other job; the standing in one position so many hours occasions swellings in the legs, as our plants are not like those of China only three feet high, but double that size, so that one must stand upright to gather the leaves. The Chinese pluck theirs squatting down. We lie under a great disadvantage in not having regular men to pluck the leaves; those that have been taught to do so, can pluck twice as many as those that have not, and we can seldom get hold of the same men two seasons running. I am of opinion that our trees will become of a smaller and more convenient size after a few years cultivation; because, trimming of the plants and taking all the young leaves almost as soon as they appear, month after month and year after year, and the plants being depriv-

ed of the rich soil they had been living on from time unknown, must soon tell upon them. Transplanting also helps to stunt and shorten the growth of these plants. The Chinese declared to me, that the China plants now at *Deenjoy*, would never have attained to half the perfection they now have, under ten years in their own country.

I may here observe, that the sun has a material effect on the leaves ; for as soon as the trees that shade the plants are removed, the leaf, from a fine deep green, begins to turn into a yellowish colour, which it retains for some months, and then again gradually changes to a healthy green, but now becomes thicker, and the plant throws out far more numerous leaves than when in the shade. The more the leaves are plucked the greater number of them are produced ; if the leaves of the first crop were not gathered, you might look in vain for the leaves of the second crop. The Tea made from the leaves in the shade is not near so good as that from leaves exposed to the sun ; the leaves of plants in the sun are much earlier in season than of those in the shade ; the leaves from the shady tract give out a more watery liquid when rolled, and those from the sunny a more glutinous substance. When the leaves of either are rolled on a sunny day, they emit less of this liquid than on a rainy day. This juice decreases as the season advances. The plants in the sun have flowers and fruit much earlier than those in the shade, and are far more numerous ; they have flowers and seeds in July, and fruit in November. Numerous plants are to be seen that by some accident, either cold or rain, have lost all their flowers, and commence throwing out fresh flower-buds more abundantly than ever. Thus it is not unfrequent to see some plants in flower so late as March (some of the China plants were in flower in April) bearing at once the old and the new seeds, flower-buds, and full-blown flowers—all at one and the same time. The rain also greatly affects the leaves ; for some sorts of Tea cannot be made on a rainy day ; for instance the *Powchong* and *Mingehew*. The leaves for these ought to be collected about 10 A. M. on a

10 MODE OF MANUFACTURING SYCHEE BLACK TEA.

sunny morning, when the dew has evaporated. The *Pow-chong* can only be manufactured from the leaves of the first crop ; but the *Mingehew*, although it requires the same care in making as the other, can yet be made from any crop, provided it is made on a sunny morning. The Chinese dislike gathering leaves on a rainy day for any description of Tea, and never will do so, unless necessity requires it. Some pretend to distinguish the Teas made on a rainy and on a sunny day, much in the same manner as they can distinguish the shady from the sunny Teas—by their inferiority. If the large leaves for the Black Tea were collected on a rainy day, about seven seers, or fourteen pounds, of green leaves would be required to make one seer, or two pounds, of Tea ; but if collected on a sunny day, about four seers, or eight pounds, of green leaves, would make one seer, or two pounds, of Tea ;—so the Chinamen say. I tried the experiment, and found it to be correct. Our season for Tea making generally commences about the middle of March ; the second crop in the middle of May ; the third crop about the first of July ; but the time varies according to the rains setting in sooner or later. As the manufacture of the *Sychee* and the *Mingehew* Black Teas has never been described, I will here attempt to give some idea how it is performed.

Sychee Black Tea.—The leaves of this are the *Souchong* and *Powchong*. After they have been gathered and dried in the sun in the usual way (see my former account of Black Tea) they are beaten and put away four different times ; they are then put into baskets, pressed down, and a cloth put over them. When the leaves become of a brownish colour by the heat, they throw out and have a peculiar smell, and are then ready for the pan, the bottom of which is made red hot. This pan is fixed in masonry breast high, and in a sloping position, forming an angle of forty degrees. Thus the pan being placed on an inclined plane, the leaves when tossed about in it cannot escape behind, or on the sides, as it is built high up, but fall out near the edge close to the manufacturer, and always into his hands, so as to be swept out

easily. When the bottom of this pan has been made red hot by a wood fire, the operator puts a cloth to his mouth to prevent inhaling any of the hot vapour. A man on the left of him stands ready with a basket of prepared leaves; one or two men stand on his right with dollahs, or shallow baskets, to receive the leaves from the pan, and another keeps lifting the hot leaves thrown out of the pan into the dollah, that they may quickly cool. At a given signal from the Chinaman, the person with the basket of prepared leaves seizes a handful, and dashes it, as quick as thought, into the red hot pan. The Chinaman tosses and turns the crackling leaves in the pan for half a minute, then draws them all out by seizing a few leaves in each hand, using them by way of a brush, not one being left behind. They are all caught by the man with the dollah or basket, who with his disengaged hand continues lifting the leaves, and letting them fall again, that they may quickly cool. Should a leaf be left behind in the pan by any accident, the cloth that is held ready in the mouth is applied to brush it out; but all this is done as quick as lightning. The man that holds the basket of leaves watches the process sharply; for no sooner is the last leaf out of the pan, than he dashes in another handful, so that to an observer at a little distance, it appears as if one man was dashing the leaves in, and the other as fast dashing them out again—so quickly and dexterously is this managed. As soon as one basket has received about four handfuls of the hot leaves from the pan, it is removed, and another basket placed to receive the leaves; and so on, until all is finished. A roaring wood-fire is kept up under the pan to keep the bottom red hot, as the succession of fresh leaves tends greatly to cool the pan, which ought always to be scrubbed and washed out after the process is over. In China these pans are made of cast iron, and if great care is not taken they will crack in the cooling; to prevent which, one man keeps tapping the inside of the edge of the pan briskly with a wet broom, used in the cleaning of the vessel, while another pours cold water in gently; thus it cools in a few seconds, and is

ready for another batch of Tea. The leaves are rolled and tatched the same as the other Teas, and put into the drying basket for about ten minutes. When a little dry, people are employed to work and press the leaves in the hands in small quantities, of about one and a half to two rupees' weight at a time, for about half a minute; they are then put into small square pieces of paper and rolled up; after this they are put into the drying basket, and permitted to dry slowly over a gentle fire for some hours, until the whole is thoroughly dry. This Tea is not sold in the China market, it is used principally as offerings to the priests, or kept for high days and holidays. It is said to be a very fine Tea, and there is not one man in a hundred who can make it properly. The *Pow-chong* Tea is made in the same way as the *Sychee*, with this exception, that it is not formed into balls.

Mingehew Black Tea.—The leaves (*Powchong*) are plucked and dried in the sun, and are then beaten and dried in the shade for half an hour; this is done three successive times, and the leaves are very much shaken by a circular motion given to them in a sieve, so as to keep them rolling and tumbling about in the centre of it. This treatment continues until they are very soft; they are then allowed to remain for a short time; the contents of the first sieve are then placed in the centre of a close worked bamboo basket with a narrow edge, and the leaves are divided into four equal parts. The contents of the second sieve are placed in another bamboo basket like the former, and this basket is placed on the top of the first, and so on piling one basket upon another until all is finished;—there may be about two pounds of leaves in each basket. The red hot pan is used the same as in *Sychee*, only now the men cast in one division of the leaves into the basket, and this is tumbled and tossed about in the red hot pan like a plaything for about thirty seconds, and then swept out; another division is cast in, and so on, until all the prepared baskets have been emptied. The contents of each basket are still kept separate, by placing the leaves when they come out of the pan in separate baskets. The whole is a brisk and a

lively scene, and quite methodical, every one knowing his station, and the part he has to perform. The baskets are then arranged on shelves to air; the contents are afterwards tatched the same as our Black Teas, and fired in the drying baskets, but with this difference, that each division is placed on paper and dried. When it is half dry (the same as our Teas) it is put away for the night, and the next morning it is picked, and put into the drying baskets over gentle deadened fires, and gradually dried there; it is then packed hot. This Tea is a difficult sort to make.

Shung Paho Black Tea.—Pluck the young (*Paho*) leaf that has not yet blown or expanded, and has the down on it; and the next one that has blown with a part of the stalk; put it into the sun for half an hour, then into the shade; tatch over a gentle fire, and in tatching roll the leaves occasionally in the pan, and spread them all round the sides of the same; again roll them until they begin to have a withered and soft appearance, then spread them on large sieves, and put them in the shade to air for the night; next morning pick, and then fire them well. Some Tea makers do not keep them all night, but manufacture and pack the Tea the same day. This Tea is valued in China, as it is very scarce; but the Chinamen acknowledge that it is not a good sort. They prefer the Teas the leaves of which have come to maturity.

The China Black Tea plants which were brought into *Muttack* in 1837, amounted in all to 1609—healthy and sickly. A few of the latter died, but the remainder are healthy, and flourish as well, as if they had been reared in China. The leaves of these plants were plucked in the beginning of March, and weighed sixteen seers, or thirty-two pounds. Many of the plants were then in flower, and had small seeds. They are about three feet high, and were loaded with fruit last year, but the greater part of it decayed when it had come to maturity, as was the case with the Assam Tea seeds, and almost every seed of these wilds, in the past year. The seeds should, I think, be plucked from the plant when thought ripe, and not be permitted to drop or fall to the ground. I

collected about twenty-four pounds of the China seeds, and sowed some on the little hill of *Tipum* in my Tea garden, and some in the Nursery ground at *Jaipore*, above three thousand of which have come up, are looking beautiful, and doing very well. I have since found out that all the China seedlings on *Tipum* hill have been destroyed by some insect.

The Assam and China seedlings are near each other ; the latter have a much darker appearance. I have made but few nurseries, or raised plants from seed, as abundance of young plants can be procured, of any age or size, from our Tea tracts. There may be about 6000 young seedlings at *Chubwa* ; at *Deenjoy* about 2000 ; at *Tingri* a few ; and some at *Paundooah*. In June and July 1837, 17,000 young plants were brought from *Muttack*, and planted at a place called *Toongroong Patar*, amongst the thick tree jungles of *Sadiya*.

In March of the same year six or eight thousand were brought from *Muttack*, and planted in different thick jungles at *Sadiya* ; many of these died in consequence of the buffaloes constantly breaking in amongst them ; the rest are doing well, but I am afraid will be killed from the above cause ; and now that I have removed to *Jaipore* they are too far off for my personal superintendence.

In 1838, 52,000 young Tea plants were brought from the *Nemsong Naga* hill tracts, about ten miles from *Jaipore* ; a great portion of these have been lately sent to Calcutta, to be forwarded to Madras ; should they thrive there, it is my opinion that they will never attain any height, at least not like ours, but be dwarfish like the China plants. *Deenjoy*, *Chubwa*, *Tingri*, and *Geela-Jhan* tracts have been filled up or enlarged with plants from the jungle tracts. In transplanting from one sunny tract to another, when done in the rains, very few, if any, die ; if the plants be removed from a deep shade to a sunny tract, the risk is greater, but still, if there is plenty of rain, few only will die. If from a deep shade to a piece of ground not a Tea tract, and exposed to the sun—for instance from the *Naga* hills to *Jaipore*—if there be plenty of rain, and the soil congenial, as it is at this place,

few will die ; if shaded by a few trees, less will perish ; if taken from shade, and planted in shade and the soil uncongenial, but there is plenty of rain, the greater portion will live ;—witness *Toongroong Patar* at *Sadiya*. If the plants are brought from deep shade, and planted in the sun in uncongenial soil, let them have ever so much rain, not one in fifty will be alive the third year ;—witness 30,000 brought to *Sadiya*. I believe the Tea plant to be so hardy that it would almost live in any soil, provided it were planted in deep shade when taken to it. There should be plenty of water near the roots, but the plants should always be above inundation. As soon as it has taken root, which it will soon do, the shade may be removed, and there will be no fear of the plant dying.

The advantage of getting plants from the jungle tracts is, that you can get them of any age or size ; nothing more is necessary than to send a few coolies early in March, just as the rains commence, and have the plants of the size required removed to your own garden ; and if they are of a moderate size, you may gather a small crop of Tea from them the next year. As these plants are very slender, it would be best to plant four or five close together to form a fine bush. If the plants are raised from seed, you may expect a small crop of Tea the third year, but they do not come to maturity under six years. It is said they live to the age of forty or fifty years. The Chinese way of digging a hole, and putting in a handful or two of seed, does not succeed so well in this country, as putting two or three seeds on small ridges of earth and covering them over, which I have found to answer better.

In clearing a new Tea tract, if the jungle trees are very large and numerous, it would be as well to make a clean sweep of the whole, by cutting them and the Tea plants all down together ; for it would be impossible to get rid of so much wood without the help of fire. The Tea plants, if allowed to remain, would be of little use after they had been crushed and broken by the fall of the large trees, and dried up by the fire ; but admitting that they could escape all this, the

leaves of trees from twelve to twenty feet high could not be reached, and if they could, they would be almost useless for Tea manufacture, as it is the young leaves, from young trees, that produce the best Teas. But if all were cut down and set fire to, we should have a fine clear tract at once, at the least expense, and might expect to have a pretty good crop of Tea one year after the cutting, or at furthest, the second year; for it is astonishing with what vigour the plant shoots up after the fire has been applied. And we gain by this process; for, from every old stock or stump cut down, ten to twelve more vigorous shoots spring up, so that in the place of a single plant you have now a fine Tea bush. I think from what I have seen of these plants, that if cut down every third year, they would yield far superior Teas; neither am I singular in this opinion, the Green Tea Chinamen having told me that they cut down their plants every ninth year, which may be reckoned equivalent to our third year, taking into consideration the size of our trees and the richness of our soil. Our trees, or plants, are certainly more than four or five times the size of theirs, and must consequently yield so many times more produce; theirs is the dwarf, ours the giant Tea. The size of the leaf matters nothing, in my opinion, provided it is young and tender; even their diminutive leaf, if one day too old, is good for nothing.

As the Green Tea Chinamen have just commenced operations, I will try to give some account of this most interesting process. All leaves up to the size of the *Souchong* are taken for the Green Tea. About three pounds of the fresh leaves, immediately they are brought in, are cast into a hot pan (sometimes they are kept overnight when abundance have been brought in, and we have not been able to work all up); they are then rolled and tossed about in the pan until they become too hot for the hand. Two slips of bamboo, each about a foot long, split at one end so as to form six prongs, are now used to tumble and toss the leaves about, by running the sticks down the sides of the pan, and turning the leaves up first with the right hand, then with the left, and this as fast

as possible ; which keeps the leaves rolling about in the pan without being burnt ; this lasts about three minutes ; the leaves will then admit of being rolled and pressed without breaking. They are now taken from the pan and rolled in dollahs, much the same as the Black Tea, for about three minutes, in which process a great quantity of the juice is extracted, if they be fresh leaves ; but if they have been kept overnight, very little juice can be expressed from them in the morning, on account of its having evaporated. The Chinamen say, this does not matter, as it makes no difference in the Tea. The leaves are then pressed hard between both hands, and turned round and pressed again and again, until they have taken the shape of a small pyramid. They are now placed in bamboo baskets or dollahs with a narrow edge, and the dollahs on bamboo framework (see fig. 2 of my former account of Black Tea), where they are exposed to the sun for two or three minutes, after which these pyramids of Tea are gently opened and thinly spread on the dollahs to dry. When the Tea has become a little dry, (which will be the case in from five to ten minutes if the sun be hot) it is again rolled, and then placed in the sun as before ; this is done three successive times. But should the weather be rainy, and there is no hope of its clearing, all this drying is done over the fire in a small drying basket, the same as with Black Tea. The Green Tea makers have as great an aversion to drying their Tea over the fire, as the Black Tea makers. The third time it has been rolled and dried, there is very little moisture left in the Tea ; it is now put into a hot pan, and gently turned over and over, and opened out occasionally, until all has become well heated ; it is then tossed out into a basket, and while hot put into a very strong bag, previously prepared for it, about four feet long, and four spans in circumference. Into this bag the Tea is pressed with great force with the hands and feet ; from fourteen to twenty pounds being put in at one time, and forced into as small a compass as possible. With his left hand the man firmly closes the mouth of the bag immediately above the

leaves, while with the right hand he pommels and beats the bag, every now and then giving it a turn ; thus he beats and turns and works at it, tightening it by every turn with one hand and holding on with the other, until he has squeezed the leaves into as small a compass as possible at the end of the bag. He now makes it fast by turns of the cloth where he held on, so that it may not open ; and then draws the cloth of the bag over the ball of leaves, thus doubling the bag, the mouth of which is twisted and made fast. The man then stands up, holding on by a post or some such thing, and works this ball of leaves under his feet, at the same time alternately pressing with all his weight, first with one foot and then the other, turning the ball over and over, and occasionally opening the bag to tighten it more firmly. When he has made it almost as hard as a stone, he secures the mouth well and puts the bag away for that day. Next morning it is opened out and the leaves gently separated and placed on dollahs, then fired and dried until they are crisp, the same as the Black Tea, after which they are packed in boxes or baskets. In China the baskets are made of double bamboo, with leaves between. The Tea may then remain on the spot for two or three months, or be sent to any other place to receive the final process. This first part of the Green Tea process is so simple, that the natives of this country readily pick it up in a month or two. The second process now commences by opening the boxes or baskets, and exposing the Tea on large shallow bamboo baskets or dollahs (see former account, fig. 1) until it has become soft enough to roll ; it is then put into cast-iron pans, set in brick fire-places, the same as described in making the *Sychee* Black Tea. The pan is made very hot by a wood-fire, and seven pounds of the leaves are thrown into it and rubbed against the pan, with the right hand until tired, and then with the left, so as not to make the process fatiguing. The pan being placed on an inclined plane the leaves always come tumbling back towards and near the operator, as he pushes them up from him, moving his hand backwards and forwards

and pressing on the leaves with some force with the palms, keeping the ends of the fingers up to prevent their coming in contact with the hot pan. After one hour's good rubbing the leaves are taken out and thrown into a large coarse bamboo-sieve, from this into a finer one, and again a still finer one, until three sorts of Tea have been separated. The first, or largest sort, is put into the funnel of the winnowing machine, which has three divisions of small traps below, to let the Tea out. A man turns the wheel with his right hand, and with the left regulates the quantity of Tea that shall fall through the wooden funnel above, by a wooden slide at the bottom of it. The Tea being thrown from the sieves into the funnel, the man turns the crank of the wheel, and moves the slide of the funnel gradually, so as to let the Tea fall through gently, and in small quantities. The blast from the fan blows the smaller particles of Tea to the end of the machine, where it is intercepted by a circular moveable board placed there. The dust and smaller particles are blown against this board, and fall out at an opening at the bottom into a basket placed there to receive it. The next highest Tea is blown nearly to the end of the machine, and falls down through a trough on the side into a basket; this Tea is called *Young Hyson*. The next being a little heavier, is not blown quite so far; it falls through the same trough, which has a division in the middle; this of course is nearer the centre of the machine. A basket is placed beneath to receive the Tea, which is called *Hyson*. The next, which is still heavier, falls very near to the end of the fan: this is called *Gunpowder Tea*; it is in small balls. The heaviest Tea falls still closer to the fan, and is called *Big Gunpowder*; it is twice or three times the size of *Gunpowder Tea*, and composed of several young leaves that adhere firmly together. This sort is afterwards put into a box and cut with a sharp iron instrument; then sifted and put among the *Gunpowder*, which it now resembles. The different sorts of Tea are now put into shallow bamboo baskets, and men, women, and children are employed to pick out the sticks and bad leaves; this is

a most tedious process, as the greatest care is taken not to leave the slightest particle of any thing but good Tea. But to assist and quicken this tiresome process beautiful bamboo sieves, very little inferior to our wire ones, and of various sizes, are employed. The different Teas are thrown into sieves of different sizes, from large Gunpowder to dust Tea; they are shaken and tossed, and thrown from one person to another in quick succession, making the scene very animating; in this way a great portion of the stalks are got rid of. After the Tea has been well sifted and picked, it is again put into the hot pans, and rubbed and rolled as before, for about one hour; it is then put into shallow bamboo baskets, and once more examined, to separate the different Teas that may still remain intermixed, and again put into the hot pan. Now a mixture of sulphate of lime and indigo, very finely pulverized and sifted through fine muslin, in the proportion of three of the former to one of the latter, is added; to a pan of Tea containing about seven pounds, about half a tea-spoonful of this mixture is put, and rubbed and rolled along with the Tea in the pan for about one hour, as before described. The Tea is then taken hot from the pan and packed firmly in boxes, both hands and feet being used to press it down. The above mixture is not put to the Tea to improve its flavour, but merely to give it a uniform color and appearance, as without it some of the Tea would be light and some dark. The indigo gives it the colour, and the sulphate of lime fixes it. The Chinese call the former *Yountin*, the latter *Acco*. Large Gunpowder Tea they call *Tychen*; little Gunpowder, *Cheochen*; Hyson, *Chingcha*; Young Hyson, *Uchin*; Skin Tea, or old leaves in small bits, *Poocha*; the fine Dust, or Powder Tea, *Chamoot*.

The leaves of the Green Tea are not plucked the same as the Black, although the tree or plant is one and the same, which has been proved beyond a shadow of doubt; for I am now plucking leaves for both Green and Black from the same tract and from the same plants; the difference lies in the manufacture, and nothing else. The Green Tea gather-

ers are accommodated with a small basket, each having a strap passed round the neck so as to let the basket hang on the breast. With one hand the man holds the branch, and with the other plucks the leaf, one at a time, taking as high as the *Souchong* leaf; a little bit of the lower end of the leaf is left for the young leaf to shoot up close to it; not a bit of stalk must be gathered. This is a very slow and tedious way of gathering. The Black Tea maker plucks the leaves with great rapidity with both hands, using only the forefinger and thumb, and collects them in the hollow of the hand; when his hand is full he throws the leaves into a basket under the shade of the tree; and so quickly does he ply his hands that the eye of a learner cannot follow them, nor see the proper kind of leaf to be plucked; all that he sees, is the Chinaman's hands going right and left, his hands fast filling, and the leaves disappearing. Our coolies, like the Green Tea Chinamen, hold the branch with one hand, and deliberately pluck off the leaf required, then the next, and so on, by which process much time is lost, and a greater number of hands are wanted. Not having a regular set of pluckers is a very great drawback to us; for the men whom we teach this year we see nothing of the next; thus every year we have to instruct fresh men. This difficulty will be removed when we get regular people attached to the Tea plantations; or when the natives of these parts become more fixed and settled in their habitations, and do not move off by whole villages from one place to another, as they have of late years been doing; and when the aversion they have throughout Assam to taking service for payment, has been overcome. They seem to hold this as mean and servile; preferring to cultivate a small patch of ground which barely yields a subsistence. I can perceive, however, that there is a gradual change taking place in the minds of the labouring class of people, or coolies: for occasionally some good able-bodied men come forward for employment. The generality of those that have hitherto offered themselves, has been from the very poorest and the most worthless in the coun-

try. In the cold season, when the men have nothing to sow or reap, two or three hundred can be collected ; but as soon as the rains set in, all but those that have not bonds, or are not involved in debt, go off to their cultivations, at the very time when our Tea operations commence. As long as things continue in this state, the price of Tea will be high ; but if this drawback were removed there is nothing to prevent our underselling the Chinese, except the experience of a few more years.

But let us return to our Teas, and take a comparative view of the qualities of the Black and Green Teas, which may nearly be as follows : *Paho* Black Tea leaf would make Green Tea, some Gunpowder, and some Young Hyson. *Pouchong*, although classed as a second Black Tea, on account of the price it fetches in the market, is a third-rate leaf, for it is rather larger than the *Souchong*. Some of it would make Young Hyson, and some Skin Tea. *Souchong* would make Hyson and Young Hyson. *Toychong* would make Skin Tea.—I will here mention the different kinds of Black Teas, to make the matter more clear to those who take an interest in the subject. *Thowung-Paho* (the *Sung fa* is the same leaf as this) is the downy little leaf not expanded, and the one next to it that has just unfolded a little. This Tea when made appears full of small white leaves, which are the little downy leaves just mentioned. *Twazee-Paho* is from the second crop, and nearly the same kind of Tea, only a little older : the leaf next the small downy one (being a little more expanded) and the small leaf below this, are taken, making three in all ; this has also numerous white leaves, but not so many as the former. *Souchong* is the next largest leaf ; this is well grown, but embraces all the leaves above it. When the upper leaves have grown out of season for *Thowung-Paho* and *Twazee-Paho*, they are all plucked for the *Souchong* from the third and fourth of the upper leaves. From *Souchong* leaves the *Minchong* and *Sychee* Teas are made in the first crop, and no other. *Pouchong* is the next largest leaf ; it is a little

older and larger than the *Souchong*. From this leaf the *Sychee* and *Minchong* Teas can be made in the first crop only. The *Pouchong* is never made in the second crop, on account of its not having a good flavour: many of the *Souchong* leaves are mixed up in this Tea. The *Toychong* leaves are those that are rejected from the *Souchong* and *Pouchong*, as being too large and not taking the roll. When the Teas are picked, these leaves are put on one side. The Chinese often put them into a bag, and give them a twist, something in the Green Tea way, and then mix them up with the *Souchong* to add to the weight. This leaf (*Toychong*) becomes worse in the second and third crops;—it is a cheap Tea, and sold to the poor. All the Black Teas that are damaged have the flower of what the Chinese call *Qui fa*, another called *Son fa*, mixed up with them. One pound of the flowers is put to each box of damaged Tea. After the Teas have been well tatched and mixed up with other sorts, these leaves give them a pleasant fragrance. The *Son fa* plant is about two feet high and kept in flower pots; it is propagated from the roots. The *Qui fa* plant is from three to four feet high; one pound of the flowers is put to a box of Tea. The plant was seen in the Botanical Gardens at Calcutta by our Chinese interpreter. The flowers of this plant are considered finer than those of the *Son fa*. I annex a rough drawing of each of them, as given to me by the interpreter; the dots in the drawings are intended for small flowers*.

* These two sketches are not deemed sufficiently instructive to be added here. One of them is entitled *Qui fa*, which is the name of the *Olea fragrans*, or Sweet-scented Olive, the flowers of which are said to be used for perfuming Teas. But it is more like the *Aglaia odorata*, a very different plant, which is also supposed to be applied in China for a similar purpose. This last, however, is called *Trjiulang* by the Chinese according to Rumph, and *Son yeip lan* according to Roxburgh. The other sketch, entitled *Lan fa*, seems to be intended for a liliaceous, or at any rate an endogenous plant. I am unable to offer any conjecture about it.—N. W.

The Black Tea makers appear to me to be very arbitrary in their mode of manufacture ; sometimes they will take the leaves of the *Thowung-Paho*, or perhaps *Twazee-Paho* ; but if it has been raining, or there is any want of coolies to pluck the leaves quickly, or from any other cause, they will let the leaves grow a few days longer, and turn all into *Souchong* ; which it must be remembered, takes all the small leaves above it. If it is the first crop, the *Souchong* and *Pouchong* leaves may all be turned into *Souchong* Tea ; but even if it is the second crop, when the *Pouchong* leaves ought not to be gathered, they are nevertheless plucked and mixed up with the *Souchong* leaves. Almost all our Black and all the Green Teas have just been made from one garden. When the Green Tea makers complained that the leaves were beginning to get too large for them—that is, they were fast growing out of *Souchong* and running into *Pouchong*—the Black Tea makers took up the manufacture, plucked all the leaves, and made excellent *Pouchong* ; so that between the two, there is not a leaf lost. When the Black Tea makers have a garden to themselves they are cruel pluckers, for they almost strip the tree of leaves for the *Souchong*, and are not at all nice in the plucking ; the third and even the fourth leaf on a tender twig is nipped off in the twinkling of an eye ; they then look about for more young leaves, and away go the *Pouchong*, and *Toy-chong* too, which is the largest leaf of all. But the Green Tea men pluck quietly, one by one, down to *Souchong*. The Black Tea men separate all their Teas into first, second, third, and fourth crop ; but the Green Tea manufacturers make no distinction ; they prepare all the Tea they can, throughout the season, box or basket it up, and when the season is over, they set off for Canton with their produce ; at least all those who do not wish to sell their Tea on the spot. The different merchants go in quest of it there. It now indiscriminately undergoes the second process ; that is, the different crops are all mixed up together. No old leaves can be mixed in the Green, as in the Black Teas ; for the long rolling in the pan crushes

them, and the fan blows them away, so that only the young leaves are left.

We shall now take a comparative view of the number of men required by the Black and the Green Tea makers for one pair of pans.

For the Black Tea makers, there will be required,

to tatch,	2 men
— roll,	4 „
— attend to the fire,	1 „
— dry,	1 „
— beat and put in the sun,	2 „

Total number of men, 10

To keep these men fully at work, from twenty-five to thirty coolies will be required to pluck leaves, and they will turn out about two boxes of Tea per day, (weighing one maund, or 80 pounds) if the weather be fine and sunny; but scarcely half that quantity if it be rainy, on account of the coolies not plucking so much on a rainy, as they would on a fair sunny day. As the people of the country become acquainted with the gathering and manufacturing, three boxes, of forty pounds each, may be expected in fine weather, adding perhaps a few men to the number of coolies.

A pair of pans for the Green Tea makers would require during the first process,

to tatch,	2 men
— receive the Tea from the pans,	1 „
— roll,	8 „
— attend to the fire,	1 „
— put the leaves in the sun and turn them, ..	4 „

Total number of men, 16

Thirty coolies would be required to keep these men in full play, and they would turn out two boxes of twenty-three seers, or forty-six pounds each, per day; in all ninety-two pounds of Tea. If the weather be rainy, of course the produce is much less; as the gatherers then do only half work.

Thus the difference between the Black and Green is, that the former requires six manufacturers less ; and that when the Black Tea is finished, boxed, and ready for exportation, the Green has only undergone the first process, and is but half finished ; although it is ready for exportation to any appointed place to receive the final and troublesome, as well as most expensive part of the process. Nevertheless the first part of the Green Tea preparation is easily learnt by the natives of this place in about two or three months. In speaking of the trouble and expense attending the second process of the Green Tea making, I beg to observe that it appears to me, from what little I have seen of it, that machinery might easily be brought to bear ; and as Assam is about to become a great Tea country, it behoves us to look to this. The Tea half made, as above described, I am informed by the Green Tea Chinamen now with me, is put either into boxes or baskets, with bamboo leaves between ; it has to make in this state a long journey by land and water, and then to go one or more months in a boat by sea, before it reaches Canton, where it is laid aside for one or two months more, before it undergoes the second process ; making in all about five months from the time it was first prepared. All that is required is to keep it dry. Now if all this be true, which I have no doubt it is, I see no reason why we could not send it to England, and have it made up there. I rather see every thing in favor of such a plan, and nothing against it. After a year's instruction under Chinamen, it might be left to the ingenuity of Englishmen to roll, sift, and clean the Tea by machinery, and, in fact, reduce the price of the Green Tea nearly one half, and thus enable the poor to drink good unadulterated Green Tea, by throwing the indigo and sulphate of lime overboard. At all events the experiment is worthy of a fair trial, and the first step towards it would be to manufacture the Tea at Calcutta ; or perhaps it would be better to let the China Green Tea makers go direct to England along with it, and have it manufactured there at once.

Now for a word about the Lead-canister maker, who is a very important man in our establishment; for without him, we could not pack our Teas.—On two tiles about an inch thick and sixteen inches square, is pasted, on one side, a sheet of very fine thick paper, said to have been made in Cochin-China; over this another sheet is pasted only at the edges. The paper must be very smooth, and without any kind of hole, knob, or blemish. To make it answer the purpose better, fine chalk is rubbed over it. The tiles thus prepared are laid one over the other and moved backwards and forwards, to ascertain if they work smoothly. The lower tile rests on two pieces of wood, about four inches in thickness, and the exact length of the tile. The room where the sheets of lead are made must be very smooth and level, as the tiles are apt to break when there is any unequal pressure on them. In the corner of the room there is a sunken brick fire-place, the upper part of which rises just a little above the floor; into this fire-place is inserted one of the cast-iron pans used for making Tea, and in one corner of the masonry is a vent hole on which in general a tea kettle stands. The pan is heated by a wood fire; an iron ladle with a handle, about six or eight inches long, answers the purpose of taking the lead out of the pan when required. The pan may hold about twenty pounds. There is also another ladle with a long handle, and holes at the bottom, to take the dross off. When lead for the sides of the boxes is required, the proportion of one maund of lead to five seers of tin is put into the pan. When well melted and freed from dross, the two tiles above mentioned are placed on the two pieces of wood, one piece being nearly under the centre, and the other at the edge of the lower tile; the upper tile is placed on the lower tile; even and square, projecting perhaps a little backwards towards the operator. The tiles being thus placed near the melted lead, the Chinaman squats down on them, placing his heels near the edge,

with his toes towards the centre ; while with his left hand he lays hold of the corner tile, and with the right holds the short ladle, which he dips into the boiler, and takes out about half a ladleful of the molten metal, tipping up the upper tile with the left hand about three inches, at the same time assisting this operation by pressing on his heels and gently lifting his toes. The upper tile being thus raised he dashes in the contents of the ladle between both, lets go with the left hand, and presses on with his toes, which brings the upper tile with some force to its former position over the lower one, and occasions the superfluous lead to gush out right and left and in front. The upper tile is then raised like the lid of a box, while the lower one rests on the piece of projecting wood underneath, and a fine thin sheet of lead, nearly the size of the tiles, is taken out, and thrown on one side ; the upper tile is then gently lowered down, another ladle of hot lead dashed in, and so on in quick succession, about four sheets of lead being made in one minute. The lower tile projecting a little beyond the upper one assists the man to lay the ladle on, and pour in the metal firmly and quickly. To vary the operation, the man sometimes stands up and places one foot on the upper tile, working with his heel and toes, the same as if both feet were on, and just as quickly. Many interruptions take place, such as examining the papers on the tiles, rubbing them with chalk, turning them round, and reversing them. Sometimes half a split bamboo is placed in front and under the tiles, with a piece of paper on it, to receive the lead that falls down, so that it may not come in contact with the ground. This lead is every now and then taken up and put back into the boiler. A maund of lead may make about twelve or thirteen boxes, which will hold forty. pounds. There are also two other tiles, about a cubit square ; these are used for making the tops of the canisters, which are generally of tin only, but can also be made from the above mixture. It is necessary in making this sheet-lead, to hold the sheets up and examine them ; for if not properly prepared, there are sometimes a number of very fine holes in them, which are not perceptible when lying on the ground or table. On this account the first twenty sheets of lead are

thrown aside and rejected, even without any examination. When the tiles have become nice and warm, it is then the fine and even sheets, without holes, are obtained. Before a sheet-lead canister can be made, it is necessary to have a model box made to fit into the wooden box, that is to hold the sheet-lead canister; on this box or shell the sheet-lead canister is made. It has a hole at the bottom to prevent any suction in putting it in, or drawing it out of the box or canister; and instead of a top it has a bar of wood across, by which it is drawn out. For soldering, tin, with the eighth or twelfth part of quicksilver, and some rosin are used. The wood part of some of the boxes is covered with paper pasted on and dried in the sun. To give the paper on the boxes a yellow colour, a mixture of paste with pulverized and sifted saffron is laid on and dried. The paper on the corners of the boxes is ornamented by means of a wooden block with flowers carved on it; on this bit of wood very thin paper, cut to its size, is placed, and a mixture, consisting of pulverized saffron, indigo, and water, having a deep green color, is laid singly on each bit of paper with a brush made of cocoanut fibres. These slips of paper are put one above the other, twenty thick, or as long as the paper takes the impression of the carved wood below. When the corners of the boxes have been ornamented with this paper and dried, another mixture, about the proportion of four seers of oil to three seers of rosin, boiled together, is applied with a cocoanut brush over all the boxes as a finish; after these are dry they are ready for the Tea.

The following table will shew the size and produce of the Tea tracts now worked, and the probable amount of Tea for this and the next season.

Names of Tea tracts fully worked in 1838.	Length and breadth of Tea tracts.	Number of plants in each Tea tract.	Average produce of single Tea plants.	Produce in 1838.	Remarks.
No. 1 Tringri,	267 by 90	5,000	4 Sa. Weight,	260 Srs.	The plants are small in this tract, including China plants.
No. 2 Tringri,	155 by 70	2,340	3-12 Sa. Wt.,	160 „	
No. 1 Kahung,	480 by 210	1,36,000	4 Sa. Weight,	680 „	
No. 1 Chubwa,	200 by 160	8,200	4 Sa. Weight,	410 „	
Deenjoy	223 by 171	8,400	2 Sa. Weight,	210 „	
From shady tracts,				1,720	
				390	
				2,110	
The probable increase of the above Tracts for 1839,....				527	
Probable produce of 1839,....				2,637 S.	5,274 lbs.

Names of the tracts to be worked in 1840.	Length and breadth of Tea tracts.	Number of plants in each Tea tract.	Probable produce of one Tea plant.	Probable produce in 1840.	Remarks.
No. 2 Kahung,	192 by 114	4,720	3 Sa. Weight,	177	The plants in these tracts } now small will not yield a good crop for two years.
No. 3 Do.	215 by 70	3,440	3 Sa. Weight,	129	
No. 2 Chubwa,	160 by 70	2,420	3 Sa. Weight,	90	
Nowholea,	476 by 160	16,480	3 Sa. Weight,	618	
Tipun,	314 by 331	24,620	3 Sa. Weight,	922	
Jugundoo,	400 by 200	17,300	3 Sa. Weight,	648	
Ningrew,	300 by 189	12,260	3 Sa. Weight,	459	
The probable produce of the above 7 tracts,...				2,943	
Add the probable produce of the other 5 tracts,..				2,637	
Probable produce of all the tracts in 1840,....				5,580	11,160 lbs.

It should be borne in mind that this is a rough calculation, and I can only give the probable amount. Most of these plants are very young, or have been recently cut down; a few years hence the plants may yield twice the above quantity. The first table exhibits the absolute produce of 1838. Now let us suppose a new settler were to take land in these parts; what would be his expenses if he were only to cultivate Tea, and had to clear forest land (in the vicinity of the Tea), ten times the size of *Nowholea*, which is, say 400 by 200 yards, and which would cost him 200 rupees to clear. Ten such tracts would cover 8,00,000 square yards. Now to cover this surface of ground with Tea plants, and the plants six feet apart each way, 3,55,555

plants would be required ; but if two plants were to be placed together, as I would recommend, then 7,11,110 plants would be required. The cost would probably be at the rate of five annas for 300 plants ; thus :

The clearing of 10 tracts, each 400 by 200 yards, ..	2,000	0	0
7,11,110 Tea plants, at 5 annas for 300,	740	11	8
Planting the above,	474	0	0
Weeding each tract 3 times each year, at 30 Rs. each tract,	900	0	0
5 Tea houses, at 50 Rs. each,	250	0	0
200 Hoes at 1 Rupee each,	200	0	0
100 Axes at 1 Rupee each,	100	0	0
100 Daws at 1 Rupee each,	100	0	0
Dollahs, Challonis, &c. bamboo apparatus,	200	0	0
8 Saws at 5 Rs. each,	40	0	0
Charcoal and firewood for baking the Tea,	200	0	0
40 Cast-iron pans, at 4 Rs. each,	160	0	0
Paper for Tea boxes,	100	0	0
Chalk and Indigo,	50	0	0
3 Maunds of Nails of sizes, at 10 Rs. per maund, ..	30	0	0
2 Elephants at 150 Rs. each,	300	0	0
2 Elephant mahoots at 6 Rs. each per month,	144	0	0
2 Elephant mates at 4 Rs. each per month,	96	0	0
Rice for 2 Elephants,	96	0	0
Lead for 888 boxes, at 3 seers per box, containing 20 seers, at 8 Rs. per maund,	532	12	9
A Cooly sirdar at 10 Rs. per month,	120	0	0
10 Duffadars, or Overseers of coolies at 3 Rs. per month,	360	0	0
Coolies to collect leaves, 30 to each tract, 20 days to each crop ; for 3 crops, or 60 days, at 3 Rs. for each man per month,	1,800	0	0
4 Native carpenters, at 12 Rs. ditto,	576	0	0
8 Sawyers, at 4 Rs. ditto,	384	0	0
2 Native Lead-canister makers, at 12 Rs. ditto, ..	288	0	0
Coolies to bring in timber for Sawyers,	150	0	0
5 Chinamen at 30 Rs. each per month,	1,800	0	0

120 Native Tea-makers at 5 Rs. each, for 5 months,

or one season,	3,000	0	0
Freight to Calcutta,	400	0	0
Ditto to England,	1,000	0	0

Total outlay for 10 tracts, Co.'s Rs. 16,591 8

Deduct charges that are not annual, viz.—

Clearing of tracts,	2,000	0	0
Purchase of Tea plants,	740	0	0
Planting ditto,	474	0	0
Building Tea houses,	150	0	0
Purchase of Hoes,	200	0	0
Do. Axes,	100	0	0
Do. Daws,	100	0	0
Do. Saws,	40	0	0
Do. Bamboo apparatus,	200	0	0
Do. Elephants,	300	0	0
		4,304	0

Total annual outlay on 10 tracts, 12,287 8 5

Average produce of 3,55,555 tea plants at 4

Sa. Wt. each plant, is 444 Mds. or 17,777 }
 Srs. or 35,554 lbs. at 2s., or 1 rupee, per } .. 35,554 0 0
 pound, would be,

Annual profit on 10 tracts, Co.'s Rs. 23,266 7 7

<i>Annual outlay.</i>	<i>Co.'s Rs.</i>	<i>Annual profits.</i>	<i>Co.'s Rs.</i>
For 10 tracts,	12,287	On 10 tracts,	23,266
For 100 tracts,	1,22,870	On 100 tracts,	2,32,660
For 1000 tracts,	12,28,700	On 1000 tracts,	23,26,600

N. B.—The deduction of 4304 Rs. not being annual outlay, is ~~not~~ included in this calculation above 10 Tracts.

	<i>Tea tract.</i>	<i>Duffadars.</i>	<i>Takelah.</i>	<i>Coolies.</i>
Required for	1	1	10	30
„ for	10	10	100	300
„ for	100	100	1000	3000

It must be remembered that this calculation has been made on 3,55,555 plants, not on double that number as I proposed, viz. to plant them in pairs, which would certainly on the lowest calculation increase the profits thirty per cent.

It should be borne in mind also, that 4 sicca weight is not the full produce of each plant; when full grown it will yield double that, or 8 sicca weight, and some even as high as 10 to 12 sicca weight. I have calculated at the rate of 4 sicca, which was absolutely produced in 1838. The plant will, I should think, produce 25 per cent. more this year, and go on increasing to what I have above mentioned. But then, on the other hand, the items which I have set down, are not all that will be required to carry on this trade on an extensive scale. The superintendence, numerous additional artizans that will be required, and a thousand little wants which cannot be set down now, but which must necessarily arise from the nature of the cultivation and manufacture, will go far to diminish the profits, and swell the outlay; but this of course will last but a few years, until the natives of the country have been taught to compete with Chinamen. It should also be remembered, that the calculation I have made on ten tracts is on a supposition that we have a sufficient number of native Tea-makers and Canister-makers, which will not be the case for two or three years to come. It is on this point alone that we are deficient, for the Tea plants and lands are before us. Yes, there is another very great drawback to the cultivation of Tea in this country, and which I believe I before noticed, namely, the want of population and labourers. They will have to be imported and settled on the soil, which will be a heavy tax on the first outlay: but this, too, will rectify itself in a few years; for, after the importation of some thousands, others will come of themselves, and the redundant population of Bengal, will pour into Assam, as soon as the people know that they will get a certain rate of pay, as well as lands, for the support of their families. If this should be the case, the Assamese language will in a few years be extinct.

I might here observe, that the British Government would confer a lasting blessing on the Assamese and the

new settlers, if immediate and active measures were taken to put down the cultivation of Opium in Assam, and afterwards to stop its importation by levying high duties on Opium land. If something of this kind is not done, and done quickly too, the thousands that are about to emigrate from the plains into Assam, will soon be infected with the Opium mania,—that dreadful *plague*, which has depopulated this beautiful country, turned it into a land of wild beasts, with which it is overrun, and has degenerated the Assamese, from a fine race of people, to the most abject, servile, crafty, and demoralized race in India. This vile drug has kept, and does now keep, down the population; the women have fewer children compared with those of other countries, and the children seldom live to become old men, but in general die at manhood; very few old men being seen in this unfortunate country, in comparison with others. Few but those who have resided long in this unhappy land know the dreadful and immoral effects, which the use of Opium produces on the native. He will steal, sell his property, his children, the mother of his children, and finally even commit murder for it. Would it not be the highest of blessings, if our humane and enlightened Government would stop these evils by a single dash of the pen, and save Assam, and all those who are about to emigrate into it as Tea cultivators, from the dreadful results attendant on the habitual use of Opium? We should in the end be richly rewarded, by having a fine, healthy race of men growing up for our plantations, to fell our forests, to clear the land from jungle and wild beasts, and to plant and cultivate the luxury of the world. This can never be effected by the enfeebled Opium-eaters of Assam, who are more effeminate than women. I have dwelt thus long on the subject, thinking it one of great importance, as it will affect our future prospects in regard to Tea; also from a wish to benefit this people, and save those who are coming here, from catching the plague, by our using timely measures of prevention.

Monthly outlay of the present standing Establishment.

Superintendent,	Co.'s Rs.	507	0	0
1st Assistant to Do.		100	0	0
2nd Do. Do.		70	0	0
1 Chinese Black Tea maker,		55	11	6
1 Ditto Assistant to Ditto,		11	1	6
1 Ditto Tea-box maker,		45	0	0
1 Ditto Interpreter,		45	0	0
1 Ditto Tea-box maker,		15	8	6
2 Ditto Green Tea makers, at 15 : 8 : 6 each, . . .		31	1	0
1 Ditto Tea-box maker,		33	4	6
1 Ditto Lead-canister maker,		22	3	0
24 Native Black Tea makers, at 5 each,		120	0	0
12 Native Green Tea makers at 5 each,		60	0	0
1 Native Carpenter,		4	0	0
1 Coolie Sirdar,		10	0	0
4 Muhouts, at 6 each,		24	0	0
4 Ditto Mates, at 4 each,		16	0	0
Rice for 4 Elephants per month,		18	0	0
4 Sawyers, at 4 each,		16	0	0
2 Dāk runners, at 3 : 8 : 0 each,		7	0	0
4 Duffadars, at 3 each,		12	0	0
<hr/>				
Fixed monthly expenditure in Assam,		1,215	14	0
Cash paid to Chincse families in China,		131	2	6

Total monthly expenditure, 1,347 0 6

or 16,000 a year, not including coolies and other items. It should be remembered that this establishment has been confined to a few tracts as an experiment, and has never been fully worked. The Chinese Green Tea makers, Canister-makers, and interpreter, have lately been added to the establishment; their services have not as yet been brought into account. We are just now availing ourselves of them by making Green Tea; and as the natives at present placed under them become available, large quantities of excellent Green Tea will be manufactured. I suppose two Chinamen might qualify twenty-four natives for the first process; the

second, as I have already recommended, might be performed in England, which, in my humble opinion, would effect a great saving, by getting machinery to do the greater part of the work. At all events, it never could be manufactured in Assam without a great expense, and this for want of labourers. However, it is gratifying to see how fast the Chinese acquire the Assamese language; for after they have been a year in the country, they begin to speak sufficiently well for all ordinary purposes, so that an interpreter can very well be dispensed with. Our Chinamen can speak the Assamese language much better than the interpreter can the English language. They are a violent, headstrong, and passionate people, more especially as they are aware we are so much in their power. If the many behave as do the few, a Thannah would be necessary to keep them cool.

With respect to what are called the *Singpho* Tea tracts, I am sorry to say we have not been able this year to get a leaf from them, on account of the disturbances that have lately occurred there; nor do I believe we shall get any next year, unless we establish a post at *Ningrew*, which I think is the only effectual way to keep the country quiet, and secure our Tea. The Tea from these tracts is said by the Chinamen to be very fine. Some of the tracts are very extensive, and many may run for miles into the jungles for what we know. The whole of the country is capable of being turned into a vast Tea garden, the soil being excellent, and well adapted for the growth of Tea. On both sides of the Buri-Dehing river, as will be seen by the map, the Tea grows indigenous; it may be traced from tract to tract to *Hookum*, thus forming a chain of Tea tracts from the Irrawaddy to the borders of China, east of Assam. Ever since my residence at Sudiya this has been confirmed year after year by many of my Kamptee, Singpho, and Dewaneah acquaintances, who have traversed this route. It is therefore important for us to look well to our Eastern frontier, on account of our capability to extend our Tea cultivation

in that direction. England alone consumes 31,829,620 lbs. nearly four laks of maunds, annually. To supply so vast a quantity of Tea, it will be necessary to cultivate all the hills and vallies of Assam; and on this very account a post at *Ningrew* becomes doubly necessary. A few years hence, it may be found expedient to advance this frontier post to the top of the *Patkai* hill, the boundary line of our eastern frontier. Any rupture with Burmah would add to our Tea trade, by taking from them *Hookum*, and *Munkoom*, and having the Irrawaddy as our boundary line. These countries are nominally under the Burmese, as they pay a small annual tribute; but this can never be collected without sending an armed force. They are said to be thinly inhabited, the population being kept down by the constant broils and wars, which one petty place makes upon another for the sake of plunder. All the inhabitants drink Tea, but it is not manufactured in our way; few, it is said, cultivate the plant. I have for years been trying to get some seeds or plants from them, but have never succeeded, on account of the disturbed state in which they live. The leaves of their Tea plants have always been represented to me as being much smaller than ours.

Muttuck is a country that abounds in Tea, and it might be made one extensive, beautiful Tea garden. We have many cultivated experimental tracts in it; we know of numerous extensive uncultivated tracts, and it appears to me that we are only in the infancy of our discoveries as yet. Our Tea, however, is insecure here. It was but a month or two ago that so great an alarm was created, that my people had to retire from our Tea gardens and manufacture at *Deenjoy* and *Chubwa*, which will account for the deficiency of this year's crop. Things must continue in this state until the government of the country is finally settled; for we are at present obliged, in order to follow a peaceful occupation, to have the means of defending ourselves from a sudden attack, ever since the unfortunate affair at *Sudiya*. Be-

fore the transfer of the Tea tracts in this country can be made, it will be necessary, in justice to all parties, to know if *Muttuck* is, or is to become, ours, or not. The natives at present are permitted to cultivate as much land as they please, on paying a poll-tax of two rupees per year; so that if the country is not ours, every man employed on the Tea will be subject to be called on for two rupees per annum, to be paid to the old Bura Senaputy's son, as governor of the country. This point is of vital importance to our Tea prospects up here. Many individuals might be induced to take Tea grounds, were they sure, that the soil was ours, and that they would be protected and permitted to cultivate it in security.

In looking forward to the unbounded benefit the discovery of this plant will produce to England, to India.—to millions, I cannot but thank God for so great a blessing to our country. When I first discovered it, some 14 years ago, I little thought that I should have been spared long enough to see it become likely eventually to rival that of China, and that I should have to take a prominent part in bringing it to so successful an issue. Should what I have written on this new and interesting subject be of any benefit to the country, and the community at large, and help a little to impel the Tea forward to enrich our own dominions, and pull down the haughty pride of China, I shall feel myself richly repaid for all the perils and dangers and fatigues, that I have undergone in the cause of British India Tea.

Jaipore, 10th June, 1839.

II.—*Calcutta Flora, containing a Synopsis of Plants indigenous to, or cultivated in the vicinity of Calcutta, arranged according to their natural families; with observations on the properties, and manner of cultivating some of the most interesting.* By J. W. MASTERS, late Head Gardener at the Hon'ble East India Company's Botanic Garden, Calcutta.

[Read at the Meeting of the Society, on the 12th June, 1839.]

For upwards of three years it has been my most anxious desire to compile a book of reference for the use of the members of our Society. Through the whole of this time, and more especially during the last eight months, in which I have had no other employ, I have been collecting materials for the purpose, and have in some measure succeeded. This intended book I have had the presumption to designate "*Calcutta Flora.*" Part the first, to contain a synopsis of plants indigenous to, or cultivated in the vicinity of Calcutta, arranged according to their natural families; with observations on the properties, and manner of cultivating some of the most interesting. Part the second, to contain—

1. General observations on the cultivation of plants.
2. A list of the most approved fruit-bearing plants, with their scientific and local names; and a description of the most successful modes of propagation and culture.
3. A list of ornamental flowering plants; their habit of growth, time of flowering, and proper situation in an ornamental plantation.
4. A list of medicinal and spice-bearing plants, with modes of propagation and culture.
5. A list of culinary vegetables, or kitchen-garden plants, with descriptions of successful modes of culture.
6. A miscellaneous list of plants suited to field culture.
7. A list of timber trees, and of such plants as yield articles of commercial importance.

8. A list of domestic and commercial articles produced by Indian plants.

9. A calendar of monthly operations.

10. A copious Index.

Having collected my materials, I began to arrange them for publication; but just as I had finished p. 44, I was suddenly interrupted, and compelled to give up all idea of continuing the subject at present, as the whole of my time will be taken up with more important matters for several months to come. Should I hereafter find leisure I will resume, and if possible, complete the work. The few pages which I now have the pleasure to forward to you, will give the Society an idea of the character of the Synopsis, and of my intention, had I sufficient leisure to complete them. What I send is a rough copy, but it is the only one, for I have not time to take one for myself.

The following rough and hurried sketch, will also give some idea of the number of plants to be met with in the vicinity of Calcutta.

	<i>Species.</i>		<i>Species.</i>
Ranunculaceæ,.....	19	Memecylaceæ,	2
Papaveraceæ,	7	Malastomaceæ,.....	4
Nymphæaceæ,	8	Myrtaceæ,	49
Myristicaceæ,	4	Philadelphaceæ,	1
Magnoliaceæ,	8	Cornaceæ,.....	2
Anonaceæ,	33	Loranthaceæ,	5
Dilleniaceæ,	9	Cucurbitaceæ,.....	47
Umbelliferæ,	21	Cactaceæ,.....	41
Araliaceæ,.....	14	Homaliaceæ,.....	2
Escallomaceæ,	1	Mesembryuceæ,	1
Berberaceæ,	4	Begoniaceæ,	7
Vitaceæ,	30	Cruciferæ,.....	30
Pittosporaceæ,	4	Capparidaceæ,	16
Olaraceæ,	6	Resedaceæ,	2
Lancouretæ,	?	Violaceæ,	8
Onagraceæ,	20	Samydaceæ,	5
Combretaceæ,...	28	Moringaceæ,.....	1
Alangiaceæ,.....	2	Droseraceæ,	4
Rhizophoraceæ,	6	Passifloraceæ,	15

	<i>Species.</i>		<i>Species.</i>
Papayaceæ,	1	Rosaceæ,	51
Flacourtiaceæ,	12	Leguminosæ,	384
Turneraceæ,	2	Connaraceæ,	4
Bixaceæ,	3	Chrysobalanaceæ,	3
Guttiferae,	17	Calycanthaceæ,	2
Hypericaceæ,	3	Saxifragaceæ,	4
Ternströmiaceæ,	9	Crassulaceæ,	13
Aceraceæ,	3	Amyridaceæ,	2
Sapindaceæ,	34	Anacardiaceæ, ..	30
Æsculaceæ,	2	Corylaceæ,	3
Polygalaceæ,	4	Betulaceæ,	1
Elutinaeæ,	2	Trewiaceæ,	2
Linaceæ,	3	Urticaceæ,	86
Sterculiaceæ,	64	Ulinaceæ,	6
Malvaceæ,	86	Stilaginaceæ,	10
Elæocarpaceæ,	8	Myricaceæ,	2
Dipteraceæ,	9	Juglandaceæ,	2
Tiliaceæ,	31	Casuaraceæ,	2
Lythraceæ,	14	Datisceæ,	1
Meliaceæ,	26	Chloranthaceæ,	2
Cedrelaceæ,	6	Saururaceæ,	3
Aurantiaceæ,	28	Piperaceæ,	5
Spondiaceæ,	6	Salicaceæ,	2
Rhamnaceæ,	19	Monimiaceæ,	1
Burseraceæ,	11	Santalaceæ,	1
Euphorbiaceæ,	111	Flæagnaceæ,	5
Celastraceæ,	32	Illegereæ,	1
Malpighiaceæ,	16	Thymelaceæ,	3
Portulacaceæ,	8	Hernandiaceæ,	2
Menaceæ,	18	Aquilariaceæ,	1
Alsinaceæ,	3	Proteaceæ,	1
Camariaceæ,	2	Lauraceæ,	36
Ilcebraceæ,	5	Cassythaceæ,	1
Chnaceæ,	5	Nepenthaceæ,	1
Imarubaceæ,	1	Aristolochiaceæ,	6
Butaceæ,	7	Amarantaceæ,	41
ygophyllaceæ,	3	Chenopodiaceæ,	14
anthoxylaceæ,	16	Phytolaccaceæ,	3
eraniaceæ,	11	Polygonaceæ,	20
alsaminaceæ,	7	Nyctaginaceæ,	8
xalidaceæ,	7	Menispermaceæ,	14
oriariaceæ,	1	Brexiaceæ,	1

	<i>Species.</i>		<i>Species.</i>
Vaccinacææ,	5	Jasminacææ,	33
Primulacææ,	3	Gnetacææ,	2
Myrsinacææ,	32	Cycadacææ,	7
Sapotacææ,	15	Coniforææ,	17
Ebenacææ,	18	Taxacææ,	7
Styracææ,	5	Equisetacææ,	1
Aquifoliacææ,	1	Zingiberacææ,	91
Cuscutacææ,	4	Marantacææ,	21
Convolvulacææ,	59	Musacææ,	16
Polemoniaceææ,	2	Amaryllidacææ,	90
Lobeliaceææ,	8	Burmanniaceææ,	2
Campanulacææ,	7	Taccacææ,	4
Stylidiaceææ,	2	Iridacææ,	18
Scævolacææ,	1	Bromeliaceææ,	16
Cinchonacææ,	119	Hydrocharacææ,	5
Caprifoliaceææ,	9	Orchidacææ,	198
Galiaceææ,	3	Vanillaceææ,	2
Compositææ,	147	Palmacææ,	46
Dipsacææ,	3	Ponederacææ,	3
Plantaginacææ,	5	Milanthacææ,	1
Plumbaginacææ,	3	Liliacææ,	75
Cordiacææ,	7	Commelinacææ,	18
Ehretiaceææ,	9	Butomacææ,	1
Boraginacææ,	14	Ahsmacææ,	3
Labiataææ,	95	Junceææ,	1
Verbenacææ,	73	Smilacææ,	11
Myoporacææ,	2	Dioscoreacææ,	14
Pedaliacææ,	5	Roxburghiacææ,	2
Bignoniaceææ,	28	Pandanaceææ,	9
Cyrtandracææ,	2	Araceææ,	34
Acanthacæææ,	88	Acoracææ,	4
Lentibulacæææ,	3	Typhaceææ,	9
Gesneracæææ,	10	Fluviales,	3
Scrophulariacæææ,	35	Pistiaceææ,	4
Solanacæææ,	45	Graminacææ,	160
Cestracæææ,	1	Cyperacææ,	61
Gentianacæææ,	10	Restiacææ,	2
Apocynacæææ,	61	Filices,	46
Asclepiadacæææ,	56	Lycopodiaceææ,	6
Loganiacæææ,	2	Characæææ,	3
Oleaceæææ,	23		

Omitting mosses, mushrooms, lichens, and sea-weed, of which I am not at present able to give any account, we shall

have about 3,972 for the probable number of species to be found in the vicinity of Calcutta. This I believe is a greater number than can at present be found in the Honorable Company's Botanic Garden. In a work entitled "British India," vol. iii. p. 159, we are told that in 1814 the number of species amounted to 3500. I believe there are not 4000 species now. When I left the Botanic Garden on the 4th September, 1838, my own catalogue of plants in that Garden contained 1155 genera, and 3609 species. Although I have given the number 3972 as the probable amount of species, yet that number alludes to plants that have been named, and described; it does not contain all that are in the vicinity of Calcutta. I think it probable that there yet remains a vast number of plants to be discovered within ten miles of Fort William, plants that have never yet appeared in any catalogue of *Indian plants*.

EXOGENS, OR DICOTYLEDONS.

Stem consisting of bark, wood, pith, and medullary rays. Leaves reticulated, seeds enclosed in a pericarp.

Polypetalæ.

Floral envelopes consisting of both calyx and corolla. Corolla composed of distinct petals.

Order I.—*Ranunculaceæ*. Lindl. p. 5.

Herbs, rarely shrubs. Leaves alternate or opposite, generally much divided, with the petiole dilated and forming a sheath half clasping the stem. Inflorescence variable.

Suspicious plants, often poisonous, seeds sometimes harmless. Propagated by seeds, cuttings, or division.

Genera 7.

Species 19.

CLEMATIS. Linn.

Odorata. Wall.

Cylindrica. Linn. N. America.

Viorna. Linn. N. America.

Flammula. Linn. France.

Viticella. Linn. Spain.

Gouriana. Roxb. Bengal.

? *Lathynifolia*?

Integrifolia. Linn. Hungary.

? *Odoratissima*?

Wigthiana. Wall. Neelgherries.

ADONIS. *Linn.*

Autumnalis. *Linn.* Britain.

DELPHINUM. *Linn.*

Ajacis. *Linn.* Gardens.

NARAVELIA. *DeC.*

Zeylanica. *DeC.* India.

NIGELLA. *Linn.*

Arvensis. *Linn.* Germany.

Sativa. *Linn.* Gardens.

RANUNCULUS. *Linn.*

Sceleratus. *Linn.* India.

THALICTRUM. *Linn.*

Elatum. *Jacq.* Hungary.

Foliolosum. *DeC.* Nepal.

Bractiatum. *Roxb.* Bengal.

Here we have but a very small portion of this somewhat large European order; the English catalogues enumerate upwards of 500 genera and 5000 species. They occur more frequently on the hills, in Nepal and on the Himalaya than in lower Bengal, or the plains of India.

The order consists of very pretty perennial climbers, tuberous-rooted herbaceous flowering plants, and annuals.

Nigella sativa, *kala-jeera*, is cultivated in India, and used as a condiment and a medicine.

“These small dark-coloured aromatic, pleasant-tasted seeds, somewhat resemble large grains of gunpowder, and are used by the natives in cases of indigestion, and in certain bowel complaints; they are also prescribed as an external application mixed with gingilic oil, in eruptions of the skin: the natives use much of this seed as a seasoner for their curries, and have a notion that when it is put amongst linen it keeps away insects.” *Ainslie*.

Thalictrum foliolosum. The roots are used as a bitter in the cure of fevers. *Royle*.

Ranunculus sceleratus, *Linn.* *Indicus*, *Roxb.* *Carnosus*, *Wall.* is found every where near water, and is used as a vesicatory. *Royle*.

But few of this beautiful order are likely to succeed in this part of Bengal.

Aconitum ferox, *Wall.* A native of Nepal and Himalaya, has been described by Dr. Wallich as a virulent poison, but I am not aware that it is to be found in this neighbourhood. Several varieties of the Larkspur, and a few other annuals, would probably succeed during the cold season.

Order 2.—*Papaveraceæ*. Lindl. p. 7.

Herbaceous plants or shrubs, with a milky juice. Leaves alternate, more or less divided. Peduncles long, one-flowered; flowers never blue. Seeds oily, propagated by seeds chiefly.

Genera 4. Species 7.

ARGEMONE. Linn.

Mexicana. Linn. Common.

CHELIDONIUM. Linn.

Majus. Linn. Britain.

GLAUCIUM. Tourn.

Corniculatum. DeC. Europe.

PAPAVER. Linn.

Clinensis.

Dubium. Linn. Britain.

Rhoeas. Linn. Britain.

Somniferum. Linn. Britain.

Sub-order.—*Fumaricæ*. Lindl. p. 9.

Genus 1. Species 2.

FUMARIA. Linn. Europe.

Officinalis. Linn. Europe.

Parviflora. Lam. Bengal?

Argemone Mexicana. *Shial-kanta*. "The bitter-tasted yellow juice of the tender stalks and leaves of this annual thorny plant, is considered by the Indians as a valuable remedy in ophthalmia, dropt into the eye, and over the tarsus, and as a good application to chancres. An useful oil is prepared from the seeds." *Ainslie*.

Papaver somniferum. *Post. Poppy*. The oil obtained from the seeds of this plant is found to be perfectly wholesome, and is consumed in considerable quantities in Europe. Opium is the inspissated juice of poppies, and is an article of very great commercial importance in India. The red, white, and variegated double varieties of *P. Rhoeas* thrive here in the cold season, and by frequent sowings and waterings, a succession of bloom may be obtained till the month of April.

Order 3.—*Nymphæaceæ*. Lindl. p. 10.

Herbs with peltate or cordate fleshy leaves, arising from a prostrate trunk, growing in quiet waters. Seeds farinaceous and wholesome. Propagated by seeds and division.

Genera 3. Species 8.

EURYALE. *Salisb.*Ferox. *Salisb.* Bengal.NELUMBium. *Juss.*Speciosum. *Willd.* Bengal.NYPHÆA. *Linn.*Cyanea. *Roxb.* India.NYPHÆA. *Linn.* *Esculenta. *Roxb.* India.Lotus. *Roxb.* India.Rubra. *Roxb.* India.Stellata. *Roxb.* Bengal.Versicolor. *Roxb.* Bengal.

The flowers of this somewhat tropical order are eminently beautiful; the roots, after having been subjected to the action of heat, are edible.

Euryale ferox, *Salisb.* *Anneslia spinosa*. *Roxb.* *Makana—kanta pudoo* of the natives. “The seeds are farinaceous, much liked by the natives, and sold in the public bazars to the eastward of the mouths of the Ganges, where the plant is indigenous. The method of preparation, to fit them for the table, is as follows: a quantity of sand is put into an earthen vessel, placed over a gentle fire; in the sand they put a quantity of the seed, agitate the vessel, or the sand with an iron ladle; the seed swells to more than double its original size, until it becomes light, white and spongy; during the operation the hard husk of the seed breaks in various parts, and then readily separates by rubbing between two boards, or striking it gently with a bye-board. The Hindu physicians consider these seeds to be possessed of powerful medical virtues.” *Roxb.*

Nymphæa cyanea, *Nyel-pudm*; *N. esculenta*, *Chota-soondi*; *N. Lotus*, *Shulook*; *N. rubra*, *Rukta-kunbula*, and *Nelumbium speciosum*, *Pudma-pudoo*, are all much valued for the beauty of their flowers. The rhizoma or creeping stem is eaten by the natives, and the leaves of *Nelumbium* are used instead of plates.

Order 4.—*Myristicaceæ*. Lindl. p. 15.

Tropical trees, often yielding a red juice. Leaves alternate, without stipules, not dotted, quite entire, stalked, coriaceous. Inflorescence axillary or terminal, flowers sometimes dioecious, often each with one short cucullate bract. Calyx coriaceous, mostly downy outside, with the

hairs sometimes stellate, smooth in the inside. Fruit aromatic. Propagated by seeds, cuttings or layers.

Genus 1. Species 4.

MYRISTICA. *Linn.*

Grandiflora. Wall.

Moschata. Thunb. Moluccas.

Nitida. Wall.

Tomentosa. Thunb.

Myristica Moschata, (Nutmeg tree,) is a native of the Moluccas, and has not been cultivated with any great deal of success in the vicinity of Calcutta. I think it never will succeed here, so as to render the fruit of any great deal of commercial importance; but it appears probable that any gentleman may grow a sufficient quantity of nutmegs for the consumption of his own family, provided he will take the trouble to pay proper attention to his trees. In the first place fruit-bearing trees must be obtained, and when obtained they require to be planted in suitable situations: all that I have seen have been planted in what I consider the worst place that could be selected. They are nearly all planted under the dense shade of Mango-trees, and being thus deprived of light, and a free circulation of the air around them, besides being starved by the roots of the Mango-trees, it is next to impossible for them to thrive; it is absurd to expect them to become fruitful under such circumstances. The nutmeg tree requires shade for three or four years after first planting, and the shading to be lessened by degrees as the tree advances, and is able to bear the full sun. It will then only require partial shading in the hottest weather. It may be argued that about two-thirds of the plants which have been introduced from the Moluccas either do not bear fruit at all, or are very shy-bearers. This is admitted; but then on the other hand about one-third of them do bear fruit, and that without having any more attention paid to them, than is paid to indigenous plants. (Among others *Flacourtia inermis*, *Cycas*

circinalis, *Melaleuca cajaputi*, *Klienhowia hospita* and *Xanthochymus dulcis*; these are all natives of the Moluccas, and they blossom and bear freely in the vicinity of Calcutta.) Besides the nutmeg has been produced here, and the trees continue to bear occasionally even now, notwithstanding the unfavorable situations in which they are placed; with better culture they would become more fruitful.

Order 5.—*Magnoliaceæ*. Lindl. p. 16.

Fine trees or shrubs. Leaves alternate, not dotted, coriaceous, articulated distinctly with the stem: with deciduous stipules, which, when young, are rolled together like those of *Ficus*. Flowers large, solitary, often strongly odoriferous. Scales of the leaf-bud formed of stipules either placed face to face or rolled up. Bark and seeds bitter. Propagated by seeds, cuttings, layers, or *goottees*.

Genera 2. Species 8.

MICHELIA. Linn.

Champaca. Linn. India.
Doltsopa. DeC. Nepal.
Kisopa. DeC. Nepal.
Oblonga. Wall. Pundua.

MAGNOLIA. Linn.

Fuscata. And. China.
Grandiflora. Linn. N. America.
Pumila. And. China.
Sphenocarpa. Wall. Silhet.

These trees are eminently ornamental, their flowers exquisitely fragrant. *Michelia Champaca* is found in gardens all over India as high up as the Doon*, and on the Choor mountain; and is very deservedly admired by both Natives and Europeans. *Magnolia fuscata*, *Pumila* and *Sphenocarpa* grow and blossom freely in this neighbourhood, but rarely ripen their seed. The remaining four are scarce.

Order 6.—*Anonaceæ*. Lindl. p. 18.

Trees or shrubs. Leaves alternate, simple, without stipules. Flowers usually green or brown, axillary; the peduncles of abortive flowers sometimes indurated, enlarged and hooked. Fruit edible. Propagated by seeds, cuttings, layers, *goottees*, or grafts.

* Valley of Deyrah at the foot of the Himalayas.—H. H. S.

Genera 7. Species 33.

ANONA. Linn.	Propinqua. Wall. Nepal.
Cherimolia. Linn. S. America.	UNONA. Linn.
Muricata. Linn. W. Indies.	Dasymoschala. Blum.
Squamosa. Linn. Gardens.	Dumosa. Roxb. Silhet.
Reticulata. Linn. Gardens.	Fasciculata. Wall.
ARTABOTRYS. R. Br.	Lacvigata. Wall.
Densiflora.	Penduliflora. Wall.
Odoratissima. R. Br. Chin.	UVARIA. Linn.
GUATTERIA. R. and P.	Bicolor. Roxb. Silhet.
Badajamba. Wall. Chittagong.	Bracteata. Roxb. Silhet.
Cerasaides. Dun. Circars.	Grandiflora. Roxb. Sumatra.
Fasciculata. Wall.	Peteroclita. Roxb. Garr. Hills.
Longifolia. Wall. Tanjore.	Hirsuta. Roxb.
Subirosa. Dun. India.	Macrophylla. Roxb. Bengal.
Velutina. DeC. India.	Odorata. Roxb. Sumatra.
HYALOSTEMMA. Wall.	Purpurea. Blum.
Roxburghiana. Wall. Silhet.	Sesquipedalis. Coleb.
KADSURA. Juss.	Undulata. Roxb. Chittagong.
Grandiflora. Wall. Nepal.	Ventricosa. Roxb. Tippera.
Japonica. Dun. Silhet.	Villosa. Roxb. Bengal.

The Anonas produce delicious fruit, the rest are for the most part, very ornamental flowering plants. The flowers of Uvaria Odorata, and of Artabotrys Odoratissima are deliciously fragrant. "The leaves of *Anona Squamosa* have a heavy disagreeable odour, and the seeds contain a highly acrid principle fatal to insects, on which account the natives of India use them powdered and mixed with the flour of *gram* or *cicer arietinum* for occasionally washing their hair." Royle.

Order 7.—*Dilleniaceæ*. Lindl. p. 20.

Trees or shrubs, rarely herbaceous plants. Leaves usually alternate and without stipules; seldom opposite, most commonly coriaceous, and with strong veins running straight from the midrib to the margin, entire or toothed, often separating from the base of the petiole. Flowers solitary, interterminal racemes or panicles, often yellow. Bark and leaves astringent. Propagated by seeds, cuttings, layers, *goottees* or grafts.

Genera 5. Species 9.

COLBERTIA. DeC.

Coromandeliana. DeC. Circars.

DELIMA. Linn.

Hebecarpa. DeC. Penang.

Sarmentosa. DeC. Silhet.

WORMIA. Rattl.

Dentata. DeC. Ceylon.

DILLENIA. Linn.

Augusta. Roxb. Garr. Hills.

Scabrella. Roxb. Chittagong.

Speciosa. Thunb. Circars.

TETRACERA. Linn.

Rheedii. DeC. Travancore.

Trigyna. Roxb. Pulo Penang.

The Dillénias are stately timber trees, very ornamental; the leaves are so rough and hard that they are used for polishing metals. "The fleshy leaflets of the calyx" (of *Dillenia speciosa*, *Chalta*) "when the fruit is full grown have an agreeable acid taste, and are much used by the natives where the trees grow, in their curries. They make a tolerably pleasant jelly. The wood is both hard and tough; and used to make gunstocks." *Roxb.*

Order 8.—*Umbelliferae*. Lindl. p. 21.

Herbaceous plants, with fistular furrowed stems. Leaves usually divided, sometimes simple, sheathing at the base. Flowers in umbels, white, pink, yellow or blue, generally surrounded by an involucre. Suspicious plants, in their natural state often poisonous. The seeds for the most part aromatic, agreeable, and wholesome. Propagated by seeds chiefly, sometimes by cuttings and division.

Genera 13. Species 22.

ANETHUM. Linn.

Graveolens. Linn. Europe.

Sowa. Roxb. Bengal.

APIUM. Linn.

Graveolens. Britain.

Involucratum. Cultivated.

Petroselinum. Linn. Gardens.

ARCTOPUS. Linn.

Echinatus. Linn.

ASTERISCUM. Champ.

Oblongum. Wall.

CORIANDRUM. Linn.

Sativum. Linn. Cultivated.

DAUCUS. Linn.

Carota. Linn. Cultivated.

FERULA. Tourm.

Asafoetida. Linn.

FENICULUM. Adans.

Pamnorium. DeC. Cultivated.

Vulgare. Gaert.

HYDROCOTYLE. Linn.

Asiatica. Linn. India.

Nepalensis. Hook.

Rotundifolia. Roxb. Bengal.

Vulgaris. Linn.

LIGUSTICUM. <i>Linn.</i>	Sativa. <i>Linn.</i>
Ajowan. <i>Roxb.</i> Cultivated.	SESELI. <i>Linn.</i>
Diffusum. <i>Roxb.</i> ———	Bengalensis. <i>Roxb.</i> Bengal.
PASTINACA. <i>Towm.</i>	PHELLANDRUM. <i>Linn.</i>
Opapanax. <i>Linn.</i>	Holoniiferum. <i>Roxb.</i> Bengal.

The above is but a very small proportion of this large order. *Umbelliferae* contains upwards of 600 species, and, as many of them are annuals, they might be cultivated with success in Bengal and several parts of India during the cold season. Very good carrots are produced in the cold months; parsnips have not had much attention paid to them. Celery is generally very small, the principal cause of which is, its not being supplied with a sufficient quantity of good *fat manure*.

Ligusticum Ajowan, *Ajwan*. "This is one of the most useful, and at the same time grateful of the umbelliferous tribe. It is much cultivated in Bengal, during the cold season. The seeds, like those of caraway, have an aromatic smell, and warm pungent taste; they are much used by both Natives and Europeans, for culinary, and medicinal uses; they are among the smallest of the umbelliferous order, and are to be met with in every market in India." *Roxb.*

L. diffusum, *Jungli-ajwan*. "The seed is used as a medicine for cattle."

The above remarks of Dr. Roxburgh apply equally well to *Anethum Sowa*, *Sowa*, *Soolpa*; *Coriandrum sativum*, *Dhunya*; *Foeniculum Pamnoiium*, *Panmuhuree*; and *Apium involucratum*, *Ujmood*, all of which are cultivated and much used by the natives of India.

To this order belongs the celebrated Prangos, which was recommended in very high terms by Mr. Moorcroft seventeen years ago; but I believe no living plants have yet been raised in Bengal.

Order 9.—*Araliaceæ*. Lindl. p. 25.

Trees, shrubs or herbaceous plants. Leaves alternate, usually divided, without stipules. Flowers in umbels, or

capitate. Bark yielding gum-resin. Propagated by seeds, cuttings and *goottees*.

Genera 6. Species 14.

ARALIA. Linn.

Digitata. Willd. Circars.

Nudiflora.

Umbraculifera. Roxb. Moluccas.

GASTONIA. Comm.

Palmata. Wall. Chittagong.

Spongiosa. Comm.

GILIBERTIA. R. and P.

Peterophylla. Willd.

HEDERA. Swartz.

Confluens. Wall.

PANAX. Linn.

Aculeata. Ait.

Conchifolia. Roxb. Moluccas.

Digitata. Roxb. Silhet.

Fragrans. Roxb. Silhet.

Furticosa. Linn. Moluccas.

Palmata. Roxb. Chittagong.

SCIODAPHYLLUM. P. Br.

Pulchrum. Wall. Silhet.

These are very ornamental plants, particularly *Sciodaphyllum Pulchrum*, formerly *Aralia lucida*. Wall. This plant is rather scarce, but it is easily increased by *goottees*; *Gastonia Spongiosa* is also scarce, and not easily propagated.

Order 10.—*Escalloniaceæ*. Lindl. p. 27.

Handsome shrubs. Leaves alternate, toothed, resinous, without stipules. Flowers axillary, conspicuous. Propagated by cuttings and layers.

Genus 1. Species 1.

ITEA. Linn.

Macrophylla. Wall.

Order 11.—*Berberaceæ*. Lindl. p. 29.

Shrubs or herbaceous perennial plants, for the most part smooth. Leaves alternate, compound, usually without stipules. Fruit acid, and astringent. Propagated by seeds, cuttings, and division.

Genera 2. Species 4.

BERBERIS. Linn.

Asiatica. Roxb. Nepal.

Aristata. DeC. Mussooree.

Pinnata. Roxb. Munipore.

NANDINA. Thunb.

Domestica. Thunb. China.

“Berberries contain a considerable portion of Malic acid. The fruit of all the species is eaten, that of *B. aristata* is

dried by the hill people and sent down to the plains. The root and wood being of a dark yellow colour, are used as a dye; and being bitter and a little astringent, are also, as well as the bark, employed in medicine. The wood and bark of the Himalayan species of Berberry are not only used simply in India, but an extract is prepared from them, which is to be found in every bazar, and described in all the works on *Materia Medica*. This is prepared by digesting in water sliced pieces of the root, stem and branches, of any species of Berberry, in an iron vessel; boiling for some time, straining and then evaporating to a proper consistence. This extract is much employed in Indian medicine, and every where known by the name of *rusot*." *Royle*.

Is it not *oxalic acid*, which is found in the Berberry?

Nandina domestica is a handsome little shrub, easily increased, but does not flower freely in Bengal.

Order 12.—*Vitaceæ*. Lindl. p. 30.

Scrambling, climbing shrubs, with tumid separable joints. Leaves with stipules at the base, the lower opposite, the upper alternate, simple or compound. Peduncles racemose, sometimes changing to tendrils. Flowers small, green. Fruit and leaves acid. Propagated by seeds, cuttings and layers.

Genera 3. Species 22.

CISSUS. *Linn.*

Bracteata. *Wall.*

Cordata. *Roxb.* Amboyna.

Glandulosa. *Roxb.*

Villosa. *Roxb.*

LEEA. *Linn.*

Crispa. *Roxb.* Bengal.

Hirta. *Roxb.*

Macrophylla. *Roxb.*

Parallela. *Wall.*

Sambucina. *Roxb.* Moluccas.

Sanguinea. *Wall.*

VITIS. *Linn.*

Adnata. *Wall.* Dacca.

Auriculata. *Wall.* Mysore.

Carnosa. *Wall.* India.

Elongata. *Wall.* Bengal.

Glauc. W. & A. Mount. of India.

Lapceolaria. *Wall.* E. F. Bengal.

Latifolia. *Roxb.* Bengal.

Pedata. *Wall.*

Pallida. W. & A.. Mount. India.

Quadrangularis. *Wall.* India.

Lanata. *Roxb.* Circars.

Vinifera. *Linn.* Gardens.

A few of these are ornamental, the rest are for the most part uninteresting. The grape-vine, the only plant of real interest in the order, is now cultivated with some degree of success in this neighbourhood; (it has been very much neglected.) "The sap of the vine was at one time used in medicine, and the juice of the leaves, particularly of a variety in which they are red, considered astringent. Verjuice expressed from unripe grapes, is well known for its acidity, and used in making syrups, &c. Grapes by fermentation yield wine, alcohol, vinegar, and cream of tartar. The seeds yield oil, and the ashes of the plant salts of potass." See Royle.

Order 13.—*Pittosporaceæ*. Lindl. p. 31.

Trees or shrubs. Leaves simple, alternate, without stipules usually entire. Flowers terminal or axillary, sometimes polygamous. Fruit resinous, sometimes edible. Propagated by seeds, cuttings or *goottees*.

Genera 3. Species 4.

BILLARDIERA. Sm.

Scandens. Sm. N. S. Wales.

SOLLYA. Lindl.

Peterophylla. Lindl. N. Holland.

PITTIOSPORUM. Banks.

Ferruginum. Ait. Guiana.

Tobira. Roxb. China.

The Pittosporums are very ornamental shrubs; the other two elegant, free flowering twining plants. Scarce.

Order 14.—*Olacaceæ*. Lindl. p. 32.

Trees or shrubs often spiny. Leaves simple, alternate, entire without stipules; occasionally altogether wanting. Flowers small, axillary, often fragrant. Fruit sometimes edible. Propagated by seeds, cuttings, layers, or suckers.

Genera 3. Species 6.

? GOMPHANDRA. Wall.

Axillaris. Wall.

XIMENIA. Linn.

Aegyptica. Linn.

Americana. Willd.

OLAX. Linn.

Imbricata. Roxb. Chittagong.

Scandens. Roxb. India.

Zeylanica.

These are straggling, hostile-looking shrubs which flower and fruit freely. The roots? of *Ximenia Aegyptica*, *Hingen*, *Garee*, extend horizontally to an immense distance from the trunk, and throw up suckers so plentifully as to occupy a circle of 200 feet radius. The pulp of the fruit is "very like soft soap, exceedingly bitter, having an offensive greasy smell. The nut is employed in fireworks. A small hole is drilled in it, at which the kernel is extracted, and being filled with powder and fired, bursts with a very loud report, so exceedingly hard is the nut." *Roxb.*

X. *Americana*, *Oora-nechra*. "The ripe fruits are eaten by the natives; their taste is a compound of sour and bitter. The kernels are also eaten, and taste much like fresh filberts. The wood is yellow, like sandal, and its powder is often substituted for that of sandal by the brahmans on this part of the coast* in their religious ceremonies." *Roxb.*

Order 15.—*Francoaceæ*. Lindl. p. 33.

Herbaceous plants with lobed or pinnated leaves, without stipules. Stems scape-like with a racemose inflorescence. Petals persistent for a long time. Propagated by cuttings or division.

Genus 1. Species 1.
? *FRANCOA*. Cav.
? *Ramosa*. Don. Chili.

Order 16.—*Onagraceæ*. Lindl. p. 35.

Herbaceous plants or shrubs. Leaves alternate or opposite, simple, entire or toothed. Flowers red, purple, white, blue, or yellow, axillary, or terminal. Seeds and roots sometimes edible. Propagated by seeds, cuttings, or division.

Genera 7.	Species 20.
CLARKIA. Ph.	JUSSIEA. Linn.
Elegans.	Repens. Linn. India.
Pulchella. Ph. N. America.	Exaltata. Roxb. India.
FUCHSIA. Plum.	Villosa. Lam. India.
? Coccinea. Linn.	

* Coremandel?—H. H. S.

LUDWIGIA. *Linn.*Parviflora. *Roxb.* Bengal.Prostrata. *Roxb.* Pegu.MYRIOPHYLLUM. *Linn.*Tuberculatum. *Roxb.* India.Verticillatum. *Linn.*OENOTHERA. *Linn.*Biennis. *Linn.* N. America.Genothera. *Ait.*Mollissima. *Linn.* Buenos Ayers.Nocturna. *Jacq.* Cape G. H.Purpurea. *Cur.* N. America.Rosea. *Ait.* Peru.Stricta. *Led.* Mexico.Tetraptera. *Cav.* Mexico.Odorata. *Jacq.* S. America.TRAPA. *Linn.*Bispinosa. *Roxb.* Bengal.

The Fuchsias are very elegant little flowering shrubs, many species and varieties of which are cultivated in Europe: several have been introduced here, but have not succeeded. There are many species in South America, all of which would no doubt do very well here, if good strong plants were received, and taken proper care of. Of the Clarkias, Oenotheras and other annual and biennial species of this order, all would thrive here in the cold season, together with the perennials from South America or the West Indies. "*Trapa bicernis* is extensively cultivated in the lakes in China, and the nuts of *T. bispinosa*, called *Singhara*, are sold in all the bazars in India; and a species called by the same name, forms a considerable portion of the food of the inhabitants of Cashmere, as we learn from Mr. Forster, that it yields the Government £12,000 of revenue; and Mr. Moorcraft mentions nearly the same sum, as Runjeet Sing's share, from 96,000 to 128,000 ass-loads of this nut yielded by the lake of Ooller." *Royle.*

Order 17.—*Combretaceæ*. *Lindl.* p. 38.

Trees or shrubs. Leaves alternate, or opposite, without stipules, entire; sometimes crowded towards the extremities of the branches. Spikes axillary or terminal. Fruit often wholesome. Propagated by seeds, cuttings, layers or *goot-tees*.

Genera 8.

Species 28.

CONOCARPUS. *Linn.*Acuminatus. *Roxb.* Corom.Latifolius. *Roxb.* Coromandel.GETONIA. *Roxb.*Nutans. *Roxb.* Rajmahl.LUMNITZERA. *Willd.*

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|-------------------------------------|---|
| <i>Racemosa</i> . Willd. Sunderbun. | <i>Extensum</i> . Roxb. Amboyna. |
| <i>POIVREA</i> . Commers. | <i>Latifolium</i> . |
| <i>Coccinea</i> . DeC. Mauritius. | <i>Ovalifolium</i> . Roxb. Corom. |
| <i>Pilosa</i> . W. and A. Silhet. | <i>Rotundifolium</i> . Roxb. Silhet. |
| <i>Roxburghii</i> . DeC. India. | <i>TERMINALIA</i> . Linn. |
| <i>QUISQUALIS</i> . Linn. | <i>Bilirica</i> . Roxb. Circars. |
| <i>Indica</i> . Amboyna. | <i>Berryi</i> . W. & A. Balla-ghaut. M. |
| <i>PENTAPTERA</i> . Roxb. | <i>Catappa</i> . Linn. India. |
| <i>Arjuna</i> . Roxb. India. | <i>Chebula</i> . Retz. India. |
| <i>Bialata</i> . Roxb. — | <i>Citrina</i> . Roxb. E. Bengal. |
| <i>Oblonga</i> . Wall. ? | <i>Glabea</i> . W. and A. India. |
| <i>COMBRETUM</i> . Linn. | <i>Furcata</i> . Boj. Madagascar. |
| <i>Acuminatum</i> . Roxb. Silhet. | <i>Paniculata</i> . W. and A. India. |
| <i>Chinensis</i> . Roxb. China. | <i>Procera</i> . Roxb. Andamans. |
| <i>Costatum</i> . Roxb. Silhet. | <i>Travencorensis</i> . W. and A. Trav. |

The *Terminaliæ*, *Pentapteræ*, and *Conocarpæ* are highly ornamental and useful timber trees; the rest are elegant climbers. "*Terminalia catappa*, *Budam*." The kernels are fully as palatable as the best filberts, or even almonds; and I have every reason to think they are equally wholesome and nutritive. The tree is highly ornamental, few surpassing it in elegance and beauty. The wood is also useful."—*Roxb.*

T. Bilirica, *Buhira*. "The kernels of the fruit are eaten by the natives; they taste like filberts, but are reckoned intoxicating, when eaten in any quantity. *Wood* white, rather soft but durable. From wounds in the bark large quantities of an insipid gum issues; it much resembles *Gum Arabic*, is perfectly soluble in water, burns away in the flame of a candle, with little smell into black gritty ashes."—*Roxb.*

T. Chebula, *Hur*, *Harua*. "The tender leaves, while scarce unfolded, are said to be punctured by an insect, and its eggs deposited therein, which by the extravasation of the sap, become enlarged into hollow galls of various shapes and sizes, but rarely exceeding an inch in diameter. They are powerfully astringent, and make as good ink as oak galls. They also yield the chintz painters on the coast of Coromandel, their best and most durable yellow."—*Roxb.*

T. citrina, *Harra*, *Harva*. "A very large, and tall timber tree, a native of the various extensive forests on the eastern frontier of Bengal, where it is called *Hurituki*. The fruit of this, like that of *T. Chebula*, is an article of import in Hindu Materia Medica, and generally, I believe, both pass under the same name, so much alike are they and for the most part employed as gentle purgatives. The wood is much like mahogany, but finer grained: a beautiful specimen sent to me by Mr. Smith of Silhet, was accompanied with the following words:—*This piece of wood is from a tree which I bought; it was eighty feet long, one straight body or trunk, and was nine feet in circumference. This wood is very hard, no insect will touch it.*"—*Roxb.*

Conocarpus Latifolia, *Sheriman*, and *C. Aminata*, *Paunchinan*, are large timber trees found on the chain of mountains which separate the Circar from the Mahratta dominions. "These trees are valuable on account of their wood, particularly the first, *Sheriman*; its timber is universally esteemed for almost every economical purpose. Towards the centre it is of a chocolate colour, and is then exceedingly durable. For house and ship building, the natives reckon it superior to every other sort, *Pentaptera tomentosa* and teak excepted. The wood of *Paunchinan* is exceedingly like, and fully as strong, and as durable, if kept dry, as the former, but exposed to water it soon decays; of course it is unfit for the marine yard, but equally fit for house building when it can be obtained straight, which is seldom the case."—*Roxb.*

To this order belong *Bucida Buceras*, a native of Jamaica, and *Conocarpus Racemosa*, both highly valued for the tannin contained in their bark: they are likely to thrive here, if introduced.

Quisqualis Indica is a most elegant and powerful climber, with exquisitely fragrant flowers, white, when they first open in the morning, but changing to pink, and afterwards to red in the course of the day.

Order 18.—*Alangiaceæ*. Lindl. p. 39.

Large trees. Branches often spiny. Leaves alternate without stipules, entire without dots. Flowers fascicled, axillary. Fruit edible. Wood valuable. Propagated by seeds, cuttings and layers.

Genera 2. Species 2.

ALANGIUM. Lam.

MARLEA. Roxb.

Hexapetalum. Lam. Coromandel, *Begonifolia*. Roxb. Silhet.

Order 19.—*Rhizophoraceæ*. Lindl. p. 40.

Coast trees or shrubs. Leaves simple, opposite, entire or toothed, with stipules between the petioles. Peduncles axillary. Wood durable. Bark astringent. Propagated by seeds and cuttings.

Genera 3. Species 6.

BRUGUIREA. Lam.

RHIZOPHORA. Linn.

Gymnorhiza. Lam. Sunderbun.

Candelaria. DeC. Sunderbun.

CARALLIA. Roxb.

Decandra. Roxb.

Lanceæfolia. Roxb. Sumatra.

Mangli. Willd. Sunderbun.

Lucida. Roxb. Circars.

Parviflora. Roxb.

Order 20.—*Memecylaceæ*. Lindl. p. 40.

Shrubs. Leaves opposite, simple, entire, without stipules, without dots. Flowers axillary, pedicellate. Fruit sometimes edible. Propagated by seeds, cuttings and layers.

Genus 1. Species 2.

MEMECLON. Linn.

Capitellatum. Kon. India.

Tinctorum. Kon. Coromandel.

These are highly ornamental flowering shrubs; the fruit of *M. tinctorum* is eaten, and the leaves used in dying.

Order 21.—*Melastomaceæ*. Lindl. p. 41.

Trees, shrubs, or herbaceous plants. Leaves opposite, undivided, usually entire, without dots, with several ribs. Flowers terminal. Fruit succulent, sometimes edible. Propagated by seeds or cuttings.

Genus 1. Species 4.

MELASTOMA. Linn.

Erythrophylla.

Litoralis. Wall.

Malabathrica. Linn. Circars.

Vagans. Roxb. Chittagong.

Order 22.—*Myrtaceæ*. Lindl. p. 43.

Trees or shrubs. Leaves opposite or alternate, entire, with transparent dots, and usually with a vein running parallel with their margin. Inflorescence variable, usually axillary. Flowers red, white, occasionally yellow, never blue. Leaves yielding an aromatic, volatile oil. Fruit succulent and wholesome or aromatic and stimulating. Propagated by seeds, cuttings, layers or *goottees*.

* *Genera* 15. *Species* 49.

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|---|------------------------------------|
| BARRINGTONIA. <i>Forst.</i> | Malaccensis. <i>DeC.</i> Malay Is. |
| <i>Acutangula. Gert.</i> India. | <i>Decora. Wall.</i> |
| <i>Racemosa. Roxb.</i> Moluccas. | <i>Ternifolia. Wall.</i> |
| <i>Speciosa. Linn.</i> Malay Islands. | <i>Vulgaris. DeC.</i> |
| CALLISTEMON. <i>R. Br.</i> | MELALUFCA. <i>Linn.</i> |
| <i>Lophanthus. Scot.</i> N. Holl. | <i>Cajaputi. Roxb.</i> Moluccas. |
| CAREYA. <i>Roxb.</i> | <i>Leucadendron. Willd.</i> |
| <i>Arborea. Roxb.</i> Coromandel. | MITROSIDEROS. <i>Gert.</i> |
| <i>Herbacea. Roxb.</i> Bengal. | <i>Linearis. Sm.</i> N. S. Wales. |
| <i>Spherica. Roxb.</i> Chittagong. | <i>Verus. Lindl.</i> Amboyna. |
| CARYOPHYLLUS. <i>Linn.</i> | MIRTUS. <i>Linn.</i> |
| <i>Aromaticus. Linn.</i> | <i>Communis. Linn.</i> Gardens. |
| EUCALYPTUS. <i>Herit.</i> | <i>Tomentosa. Ait.</i> |
| <i>Moluccana. Roxb.</i> Moluccas. | <i>Pimenta. Linn.</i> W. Indies. |
| <i>Piperita. Sm.</i> | PSIDIUM. <i>Linn.</i> |
| <i>Resinifera. Sm.</i> | <i>Cujavullus. Burm.</i> |
| EUGENIA. <i>Linn.</i> | <i>Gomause. Swz.</i> Guinea. |
| <i>Acuminata. Roxb.</i> | <i>Polycarpum. Lamb.</i> |
| <i>Acris. W. and A.</i> | <i>Pomiferum. Linn.</i> W. Indies. |
| <i>Balsamica. Jacq.</i> | <i>Pumilum. Vahl.</i> |
| <i>Brachiata. Roxb.</i> | <i>Pyriferum. Linn.</i> W. Indies. |
| <i>Buxifolia. Lam.</i> | PUNICA. <i>Linn.</i> |
| <i>Clavifolia. Roxb.</i> | <i>Granatum. Linn.</i> Gardens. |
| <i>Lanceolaria. Roxb.</i> Silhet. | <i>Nana. Linn.</i> W. Indies. |
| <i>Microphylla. Wall.</i> | SYZYGIUM. <i>Gert.</i> |
| <i>Myrtifolia. Kerr.</i> | <i>Jambolanum. DeC.</i> |
| <i>Oleina. Wall.</i> | <i>Caryophyllum. Gert.</i> |
| <i>Polypetala.</i> | <i>Nervosum. DeC.</i> |
| FOETIDIA. <i>Comm.</i> | <i>Tetragonum. Wall.</i> |
| <i>Mauritiana. Lam.</i> | SONNERATIA. <i>Linn.</i> |
| JAMBOSA. <i>Rumph.</i> | <i>Acida. Linn.</i> Sunderbun. |
| <i>Alba. W. & A.</i> Malay Islands. | <i>Apetala. Ham.</i> |
| <i>Agnea. DeC.</i> Moluccas. | |

This is an exceedingly valuable and interesting group of plants; consisting of handsome trees, and elegant shrubs; which yield fragrant flowers, edible fruit and spices.

Caryophyllus aromaticus, *Lung*, clove tree, is a native of the Moluccas, but very scarce here. Mr. Royle, speaking of the difficulty of cultivating this tree, says: "Ceylon, and the southern parts of the Indian, as well as of the Malayan Peninsula, appear the only parts of the British territories suited to the purpose, though the tree grows freely in the Calcutta garden." *Ill. p.* 217. I know not to what garden Mr. Royle here alludes, but I have seen no Clove trees *growing freely* at Calcutta. There are two plants in the Honorable Company's Botanic Garden, with very weak stems, and a few terminal leaves, but they have never been trees, they never will become trees unless they receive very different treatment from what they have received since they have been there. These two plants of the clove tree were introduced by Mr. Porter in 1823, and were planted in 1824 under the dense shade of a grove of mango trees, and each plant surrounded with a bamboo jaffery; still they are alive, (April 1839) and in situation in which a common sting-nettle could scarcely exist. That they should "grow freely," that they should thrive at all, is physically impossible. They are starved by the roots of the Mango and other large trees which grow around them, they are deprived of air and of light, and are poisoned by the carbonic acid gas which is emitted from the dense foliage under which they are planted. It is marvellous that they should yet be alive. Plants that will keep alive for 13 years in such a situation may, with common culture, be made to grow in any part of lower Bengal.

Melaleuca Cajaputi. This tree produces the famous *cajiputi* or *Kyapooti* oil, which is distilled from the leaves. The plant grows very freely here, blossoms, and ripens its seed.

"Cajaputi oil is a highly diffusible stimulant, antispasmodic, and diaphoretic. When taken into the stomach it produces a sensation of heat, fills and quickens the pulse;

and soon afterwards a copious sweat breaks out. It is efficaciously given in dropsy, chronic rheumatism, palsy, hysteria, flatulent colic, and other spasmodic and nervous affections. As a local and external stimulant, it is employed diluted with olive oil, as an embrocation to allay the pain of gout and rheumatism, and to restore vigour to joints after sprains. When put into a carious tooth, it lulls the pain of tooth-ache; and we have seen much benefit derived from rubbing it on the temples, in defective vision from a weakened state of the eyes. The dose is three or four drops on a lump of sugar.”—*T. L. D.*

Myrtus Pimenta, *Jamaica all-spice*, grows freely here; is a very ornamental tree; blossoms, and bears abundantly; the wood is exceedingly hard and durable, and is well calculated to withstand the effects of the hot, and wet seasons.

Syzygium Jambolanum, *Jumboo*, *Kala-jam*. This grows to be a large tree, is common every where, every soil and situation suiting it equally well. “The wood is hard, close-grained, and durable; it is of course used for various purposes. The bark is strongly astringent, and dyes excellent durable browns of various shades according to the corrosive employed, or the strength of the decoction. The fruits are universally eaten when ripe, by man and birds; they are of a sub-acid, astringent taste.” If soaked in a little salt and water for about an hour, a great part of the superabundant astringency is removed.—*See Roxb.*

Punica granatum, *Dalim*, *Anar*, *Pomegranate*. “The juice of the ripe fruit of the pomegranate, which is contained in the red succulent pulp which covers the numerous small seeds, is slightly acid, and extremely pleasant to the taste, not unlike that of an orange; it is very refreshing, and well calculated to quench thirst in fevers. The Hindu doctors prescribe it, combined with saffron, when the habit is preternaturally heated. The bark of the fruit, as well as the flowers, are useful astringents, and are commonly given by the natives in decoctions, combined with powdered cloves, in such bowel affections as are not accompanied with tenes-

mus. The bark of the root Mahometan physicians administer in diseases requiring astringents, and, moreover, consider it as a perfect specific in cases of tape-worm: it is then given in decoction, prepared with two ounces of fresh bark, boiled in a pint and a half of water till but three quarters of a pint remain; of this, when cold, a wine glass may be drank every half hour, till the whole is taken.”—*Ainslie*.

Here we have *Eucalyptus Resinifera*, *Metrosideros Linearis*, *Callistemon Lophanthus* from New South Wales, and the Pimenta, Pomegranate, with three species of Guava, from the West Indies, all of which thrive in the vicinity of Calcutta; there are many more of the same genera, natives of the same places, which are likely to succeed equally well.

Order 23.—*Philadelphaceæ*. Lindl. p. 47.

Shrubs. Leaves deciduous, opposite, toothed, without dots, without stipules. Peduncles axillary or terminal, in trichotomous cymes. Flowers always white, often fragrant, fruit sometimes a little scurfy. Propagated by cuttings or layers.

Genus 1. Species 1

PHILADELPHUS. *Linn.*

Inodorus. *Mill.* Carolina.

Order 24.—*Cornaceæ*. Lindl. p. 49.

Trees or shrubs. Leaves opposite, entire or toothed with primate veins. Flowers capitate, umbellate, or corymbose; flesh of the fruit eatable. Propagated by cuttings and layers.

Genera 2. Species 2.

AUCUBA. *Linn.*

Japonica. *Linn.* Japan.

CORNUS. *Tourn.*

Macrophylla. *Wall.* Kemoan.
Scarce.

Order 25.—*Loranthaceæ*. Lindl. p. 49.

Parasitical half shrubby plants. Leaves opposite, sometimes alternate, veinless, fleshy, without stipules. Flowers often monœcious, axillary or terminal, solitary, corymbose, or spiked. Fruit succulent, viscid. Propagated by seeds.

*Genera 2. Species 5.***LORANTHUS.** *Linn.*Bicolor. *Roxb.* Bengal.Globosus. *Roxb.*Longiflorus. *Den.***Viscum.** *Linn.*Monaicum. *Roxb.* Sunderbun.**Order 26.—Cucurbitaceæ.** *Lindl. p. 51.*

Roots annual or perennial, fibrous or tuberous. Stem succulent, climbing by means of tendrils. Leaves palmated, or with palmate ribs, very succulent, covered with numerous asperities. Flowers white, red, or yellow. Fruit suspicious, often edible, sometimes bitter, and purgative. Seeds oily, always wholesome. Propagated by seeds, cuttings, and layers.

*Genera 9. Species 47.***BENINCASA.** *Savi.*Cerifera. *Savi.***BRYONIA.** *Linn.*Filiformis. *Roxb.* Nepal.Garcini. *Willd.* Coromandel.Laciniosa. *Linn.* India.Scrabella. *Linn.* India.Tenella. *Roxb.* China.Umbellata. *Herb. M.* Bengal.**COCCINIA.** *W. and A.*Indica. *W. and A.* India.**CUCUMIS.** *Linn.*Colocynthus. *Linn.* India.Melo. *Linn.*Integrifolius. *Roxb.* Bengal.Momordica. *Roxb.* India.Pubescens. *Willd.* India.Sativus. *Linn.*Trigonus. *Roxb.*Turbinatus. *Roxb.*Utilissimus. *Roxb.***CUCURBITA.** *Linn.*Citrullus. *Linn.* India.Lagenaria. *Linn.*Maxima. *Duch.*Melopepo. *Linn.* India.Pepo. *Linn.* India.Ovifera. *Linn.* Astracan.**LUFFA.** *Cav.*Acutangula. *Roxb.* India.Amara. *Roxb.* Coromandel.Clavata. *Roxb.* India.Echinata. *Roxb.* Coromandel.Graveolens. *Roxb.* Rajmahl.Pentandra. *Roxb.* India.Tuberosa. *Roxb.* Circars.**MOMORDICA.** *Linn.*Charantia. *India.*Dioica. *Roxb.* Bengal.Mixta. *Roxb.*Muricata. *Roxb.* India.Operculata. *Linn.*Tubiflora. *Roxb.* Dacca.**TRICHOSANTHES.** *Linn.*Anguina. *Linn.* India.Cordata. *Roxb.* Bengal.Cucumerina. *Linn.* India.Dioica. *Roxb.* Bengal.Heteroclita. *Roxb.* Silhet.Lobata. *Roxb.* India.Palmata. *Roxb.* India.**ZANONIA.** *Linn.*Angulosa. *Wall.?*Clavigera. *Wall.* Silhet.Indica. *Linn.* India.Integerrima. *Wall.?*

This is considered a very important group of plants in India, as it yields food, medicine, and poison. The pulp of several species is cooling and nutritious, of a few species deleterious. The seeds of all are sweet, oily, and wholesome. The roots are often bitter. The products of this order have been very much improved by judicious culture; they are capable of much more improvement, and, as many species produce their cooling fruit in the hot season, they merit extensive cultivation.

Cucumis Colocynthus, *Makhal*. Bitter and powerfully drastic. Scarce.

C. Momordica, *Foont*, *Tooti*. "The fruit is much eaten both by Natives and Europeans; when young they are a good substitute for the common cucumber, and when ripe (after bursting spontaneously,) with the addition of a little sugar they are little inferior to the melon, and reckoned very wholesome."—*Roxb.*

C. utilissimus, *Kankoor*, *Kakri*. "This appears to be by far the most useful species of *Cucumis* that I know; when little more than one-half grown, they are oblong, and a little downy, in this state they are pickled; when ripe they are about as large as an ostrich's egg, smooth and yellow; when cut they have much the flavour of the melon, and will keep good for several months, if carefully gathered without being bruised and hung up; they are also in this stage eaten raw and much used in curries, by the natives. The seeds, like those of the other *cucurbitaceous* fruits, contain much farinaceous matter blended with a large portion of mild oil; the natives dry and grind them into a meal, which they employ, as an article of diet; they also express a mild oil from them, which they use in food, and to burn in their lamps. Experience as well as analogy prove these seeds to be highly nourishing, and well deserving of a more extensive culture than is bestowed on them at present. The powder of the toasted seeds mixed with sugar is said to be a powerful diuretic, and serviceable in promoting the passage of sand

or gravel. The fruit I observed above keeps well for several months, if carefully gathered and suspended. This circumstance will render them a very excellent article to carry to sea during long voyages."—*Roxb.*

The unripe fruit of all the other species is eaten, either raw or in curries.

Cucurbita Citrullus, Turboos, Turmooj. "This species of gourd, though it has not much flavour, is extremely refreshing, and is in great request amongst the natives of India during the hot season. The water-melon has been so named from the great quantity of pale red juice it contains; the vyilians prescribe it to quench thirst, and as an antiseptic in typhus fever; and I have myself given it in such cases, when I could not get oranges, with the happiest effects."—*Ainslie.*

C. Maxima, Suphura-koomra, C. Lagenaria, Kudoo, and *C. Pepo, Koomra*, are all much cultivated, and much valued, either boiled separately or in curries.

C. Ovifera, vegetable marrow, is much cultivated in America and in Europe, and is highly prized. "When very young, it is good fried with butter; when about half grown, it is excellent either boiled as a substitute for greens, or stewed in slices with rich sauce; when full grown, it is used for pies. Sabine, who has cultivated most species of cucurbita, considers the vegetable marrow without a rival."—*Loud.*

Luffa Amara, Kernea. "Every part of this plant is remarkably bitter, the fruit is violently cathartic and emetic. The juice of the roasted young fruit is applied to the temples by the natives to cure head-ache. The ripe seeds either in infusion or substance are used by them to vomit and to purge."—*Roxb.*

L. Acutangula, Jhinga, L. Clavata, and *L. Pentandra, Doondool, Purula*, are all cultivated, and eaten either in curries or boiled as turnips. Dr. Roxburgh says, the *Jhinga* is one of the best native vegetables we have in India.

Momordica Charantia, Kurilla, M. Muricata, Bara kurilla,

and *M. Dioica* are eaten by the natives, both the unripe fruit and the roots.

Trichosanthes Anguina, *Chichinga*; *T. Dioica*, *Putal*, *Pulwul*; and *T. Cucumerina*, are eaten like the other products of the same family.

Order 27.—*Cactaceæ*. Lindl. p. 53.

Succulent shrubs, very variable in form. Stems usually angular, or two-edged, or foliaceous. Leaves almost always wanting; when present, fleshy, smooth, and entire, or spine-like. Flowers either showy or minute, usually lasting only one day or night, always sessile. Fruit edible. Propagated by seeds, cuttings or offsets.

Genera 9. Species 41.

CACTUS. Linn.

Hybridus?

Jenkinsonii?

Setosus?

CEREUS. DeC.

Cylindricus. Haw. Peru.

Flagelliformis. Haw. Peru.

Grandiflorus. Haw. Jamaica.

Hexagonus. Haw. Surinam.

Multangularis. Haw. S. Amer.

Repandus. Haw. W. Indies.

Speciosissimus. Haw. S. Amer.

Tetragonus. Haw. S. America.

Triangularis. Haw. W. Indies.

Vireus?

ECHINOCACTUS. Salm.

Gayanus?

Conigerus?

EPIPHYLLUM. Haw.

Truncatum. Haw. Brazil.

MELOCACTUS. Bauh.

Amænus?

PERESKIA. Plum.

Aculiata. Mill. W. Indies.

Bleo. Humb. Mexico.

MAMILLARIA. Haw.

Coronaria. Haw. S. America.

Flavescens. Haw.

Pusilla. Swt. Missouri.

Simplex. Haw. W. Indies.

Tenuis. DeC.

Stellata. Haw. S. America.

OPUNTIA. Haw.

Albispina?

Brasiliensis. Haw. Brazil.

Cochinillifera. Haw. S. America.

Curassavica. Haw. Curassoa.

Elatior. Haw. S. America.

Ficus-indica. Haw. S. America.

Lencantha. Link.

Macrostachya?

Nigricaulis?

Parott?

Spinossissima. Haw. Jamaica.

Tomentosa. Link. S. America.

Tuna. Haw. S. America.

Vulgaris. Haw. S. Europe.

Dillenii. Haw. India?

RHIPSALIS. Gart.

Salicornioides. Haw. W. Indies.

This order contains probably upwards of 200 species, the greater part of which are natives of different parts of South

America and the West Indies, and are likely to succeed in Bengal. Of the 41 species enumerated above, about 20 species thrive without any particular care; the remainder have been lately introduced and are scarce.

Opuntia Cochinchinensis succeeds best under moderate shade, it blossoms freely, and ripens its fruit. The plant is easily increased.

O. Dillenii, *Brasiliensis* and *Spinosissima* form impenetrable hedges.

Order 28.—*Homaliaceæ*. Lindl. p. 55.

Trees or shrubs. Leaves alternate, with deciduous stipules, toothed or entire. Flowers in spikes, racemes, or panicles. Propagated by seeds, cuttings and layers.

Genus 1. Species 2.

BLACKWELLIA. Comm.

Propinqua. Wall. Penang.

Spiralis. Wall. Pegu.

Order 29.—*Mesembryaceæ*. Lindl. p. 56.

Shrubby or herbaceous plants. Leaves succulent, opposite, simple. Flowers usually terminal. Leaves sometimes edible. Propagated by seeds, cuttings or layers.

Genus 1. Species 1.

MESEMBRYANTHEMUM. Linn.

Cordifolium. Linn. Cape G. H.

Order 30.—*Begoniaceæ*. Lindl. p. 56.

Herbaceous plants or under shrubs, with an acid juice. Leaves alternate, toothed, oblique at the base. Stipules scarious. Flowers pink, in cymes. Roots bitter, and astringent. Propagated by seeds, cuttings or division.

Genus 1. Species 7.

BEGONIA. Linn.

Argyrostigma. Fish. Brazil.

Humilis. Dry. W. Indies.

Lacinata. Roxb. Garrow Hills.

Malabarica. Roxb. Chittagong.

Papillosa. Griseb. Brazil.

Reniformis. Dry.

Wightiana. Wall?

Order 31.—*Cruciferæ*. Lindl. p. 58.

Herbaceous plants, annual, biennial, or perennial, very seldom suffruticose. Leaves alternate. Flowers usually yellow or white, seldom purple. Seeds oily, antiscorbutic, and stimulant. Propagated by seeds, cuttings or division.

Genera 13. Species 30.

BRASSICA. <i>Linn.</i>	MATHIOLA. <i>R. Br.</i>
<i>Erucoides. Roxb.</i> Cultivated.	<i>Annua. Swt.</i> S. Europe.
<i>Oleracea. Linn.</i> England.	<i>Glabrata. DeC.</i>
<i>Rapa. Linn.</i>	NASTURTIUM. <i>R. Br.</i>
BUNIAS. <i>Linn.</i>	<i>Montanum. Wall.</i> Nepal.
<i>Aspera. Retz.</i> Portugal.	<i>Officinalis. R. Br.</i> Britain.
<i>Erucago. Linn.</i> Europe.	RAPHANUS. <i>Linn.</i>
CHEIRANTHUS. <i>Linn.</i>	<i>Sativus. Linn.</i> China.
<i>Chivri. Linn.</i> Britain.	SINAPIS. <i>Linn.</i>
COCHLEARIA. <i>Tourm.</i>	<i>Alba. Linn.</i> Britain.
? <i>Armoracia. Linn.</i> England.	<i>Brassicata. Willd.</i> China.
ERUCA. <i>Tourm.</i>	<i>Cuneifolia. Roxb.</i> Thibet.
<i>Sativa. Lam.</i> S. Europe.	<i>Dichotoma. Roxb.</i> Bengal.
ERYSIMUM. <i>Linn.</i>	<i>Divaricata. Roxb.</i>
<i>Canescens. Roth.</i> S. Europe.	<i>Erysimoides. Roxb.</i> Malabar.
<i>Wadeanum. Wall.</i> Kabool.	<i>Glauc. Roxb.</i> Cultivated.
KONICA. <i>R. Br.</i>	<i>Peters. Roxb.</i> Bengal.
<i>Maituna. R. Br.</i> England.	<i>Pusilla. Roxb.</i> India.
LEPIDIUM. <i>Linn.</i>	<i>Ramosa. Roxb.</i> Bengal.
<i>Sativum. Linn.</i> Persia.	<i>Rugosa. Roxb.</i> Nepal.
MYAGRUM. <i>Linn.</i>	<i>Trilocularis. Roxb.</i>
<i>Hispanicum. Linn.</i> Spain.	

But few of the *Cruciferæ* are natives of Bengal, the plants of this order therefore require some little attention from those who would cultivate them to advantage. Much improvement in their culture has been effected withip the last twenty years; and Cauliflowers are to be met with in the Calcutta market during the cold season equal to any that are exhibited in Covent Garden. Much more remains to be done. Radishes, Turnips and Brocoli are still but indifferent, and we have very few of the ornamental species. About 800 species are cultivated in Europe, many of them being annuals would thrive here in the cold season.

The different species of Mustard are much cultivated by the natives, for their seeds, which are used for various purposes; as food, stimulants, stomachics, antiscorbutics and laxatives.

Nasturtium Officinale, watercress, succeeds very well if it be supplied with plenty of water. It will grow in the soil, in a moist, shady situation. A few plants fastened to a light frame, and set floating in a tank, will afford a supply of good cresses in the cold season.

Order 32.—*Capparidaceæ*. Lindl. p. 61.

Herbaceous plants or shrubs, without true stipules, but sometimes with spines in their place. Leaves alternate, stalked, undivided, or palmate. Flowers in no particular arrangement. Fruit somewhat suspicious. Seeds pungent, and stimulant. Propagated by seeds, cuttings or layers.

Genera 7. Species 16.

CAPPARIS. *Linn.*

Aphylla. *Roxb.* India.
Brevispina. *DeC.* Malabar.
Frondosa. *Jacq.* America.
Horrida. *Linn.* India.
Sepiaria. *Linn.*

CLEOME. *Linn.*

Aspera. *Kom.* India.
Heptaphylla. *W.* Indies.
Monophylla. *Linn.* Coromandel.

CRATAEVA. *Linn.*

Nurvala. *Ham.* India.
Roxburghii. *R. Br.*

GYNANDROPSIS. *DeC.*

Pentaphylla. *DeC.* Coromandel.

NIEBUHRIA. *DeC.*

Linearis. *DeC.* India.
Oblongifolia. *DeC.*

POLANISIA. *Rafn.*

Chelidonii. *DeC.* Circars.
Icosandra. *W. and A.* India.

ROYDSIA. *Wall.*

Suaveolens. *Wall.* Silhet.

Some of these are pretty ornamental flowering plants; some thorny, straggling shrubs. *Capparis Brevispina*, *Horrida* and *Sepiaria* make formidable fences. *Roydsia Suaveolens* is a powerful climber, with fragrant flowers.

Order 33.—*Resedaceæ*. Lindl. p. 62.

Herbaceous plants with alternate leaves; the surface of which is minutely papillose; and minute, gland-like stipules.

Flowers fragrant. Fruit curious and interesting. Propagated by seeds or cuttings.

Genus 1. Species 2.

RESEDA. Linn.

Lutea. Linn. Britain.

Odorata. Linn. Egypt.

R. Lutea, Dyer's-weed, is cultivated in Europe for the valuable dye it affords; and *R. Odorata*, Mignonette, is one of the most agreeably fragrant little plants.

Order 34.—*Violaceæ*. Lindl. p. 63.

Herbaceous plants or shrubs. Leaves simple, usually alternate, sometimes opposite, stipulate, entire, with an involute vernation. Inflorescence various. Flowers often fragrant. Roots emetic. Propagated by seeds and division.

Genera 3. Species 8.

ALSODEIA. Thouars.

Bengalensis. Wall.

Roxburghii. Wall.

IONIDIUM. Vent.

Suffruticosum. Vent. India.

VIOLA. Linn.

Cuculata. Ait. N. America.

Distans. Wall. Silhet.

Odorata. Linn. Britain.

Primulifolia. Linn. Bengal.

Serpens. Wall. Nepal.

Order 35.—*Samydaceæ*. Lindl. p. 64.

Trees or shrubs. Leaves alternate, simple, entire or toothed, evergreen, with stipules, usually with pellucid markings, which are most frequently oblong. Peduncles axillary, solitary or numerous. Leaves sometimes edible. Roots purgative. Propagated by seeds, cuttings or layers.

Genus 1. Species 5.

CASEARIA. Jacq.

Coriacea. Wall. Penang.

Glabra. Boott. Moluccas.

Glomerata. Roxb. Silhet.

Ovata. Roxb. Bengal.

Vareca. Roxb. Silhet.

Order 36.—*Moringaceæ*. Lindl. p. 65.

Trees. Leaves pinnate, with an odd one. Flowers in panicles. Fruit a long pod-like capsule, edible. Seeds oily,

roots pungent, stimulant, substituted for Horse-radish. Propagated by seeds, cuttings or layers.

Genus 1. Species 1.

MORINGA. *Burm.*

Pterygosperma. DeC. India.

Order 37.—*Droseraceæ*. Lindl. p. 66.

Delicate herbaceous plants, often covered with glands. Leaves alternate, with stipulary fringes, and a circinate veneration. Peduncles, when young, circinate. Plants often poisonous. Propagated by seeds and division.

Genera 2. Species 4.

ALDROVANDA. *Monti.*

Vesiculosa. Linn.

DROSERA. *Linn.*

Burmanni. Vahl. India.

Indica. Linn.

Peltata. Sm.

Order 38.—*Passifloraceæ*. Lindl. p. 67.

Herbaceous plants or shrubs, usually climbing, seldom erect. Leaves alternate, with foliaceous stipules, often glandular. Flowers axillary or terminal, often with a three-leaved involucre. Fruit of some species edible. Propagated by seeds, cuttings or layers.

Genera 3. Species 15.

MODECCA. *Jacq.*

Dubia. Roxb. Sumatra.

Extensa. Wall?

Furfuracea. Wall. Prome.

Trilobata. Roxb. Chittagong.

Tuberosa. Roxb. Malabar.

MURUCIJA. *Tourn.*

Ocellata. Pers. W. Indies.

PASSIFLORA. *Linn.*

Courulia. Linn. Brazil.

Edulis. Sabin. W. Indies.

Fœtida. Linn.

Incarnata. Linn. N. America.

Laurifolia. Linn. W. Indies.

Lunata. Sm. Jamaica.

Mimma. Linn. Curassas.

Racemosa. Brot. Brazil.

Suberosa. Linn. W. Indies.

Order 39.—*Papayaceæ*. Lindl. p. 69.

Trees without branches, yielding an acrid milky juice. Leaves alternate, lobed, on long taper petioles. Flowers in axillary racemes. Fruit edible. Propagated by seeds.

Genus 1. Species 1.

CARICA. Linn.

Papaya. Linn. W. Indies?

"The juice of the unripe fruit is a most powerful and efficient vermifuge, the powder of the seed even answers the same purpose. The tree has, moreover, the singular property of rendering the toughest animal substances tender, by causing a separation of the muscular fibre; its very vapour even does this; newly-killed meat suspended among the leaves, and even old hogs and old poultry, when fed on the leaves and fruit, become tender in a few hours."—*Lindl.*

In Calcutta the *Papaya* is considered a valuable and wholesome fruit, it may be had at all times of the year; the tree is easily cultivated, takes up but little room, and is very prolific. The seeds have a pungent taste, somewhat like that of water-cress. The plant is much cultivated in all parts of India, and the green fruit is used in curries, preserves, pickles, &c.

Order 40.—*Flacourtiaceæ*. Lindl. p. 70.

Trees or shrubs. Leaves alternate, simple, on short stalks, without stipules, usually entire, and coriaceous. Peduncles axillary, many-flowered. Flowers sometimes unisexual. Fruit sometimes edible. Propagated by seeds, cuttings, layers or grafts.

Genera 4.

Species 12.

FLACOURTIA. *L'Herit.*CHAULMOOGRA. *Roxb.*Cataphracta. *Roxb.* E. Front.Odorata. *Roxb.* Silhet.Cordifolia. *Roxb.* Silhet.ROUMEA. *Port.*

Ferox?

Floribunda. *Wall.?*Inermis. *Roxb.* Moluccas.VARECA. *Gært.*

Nivea?

Moluccana. *Roxb.* Molucca.Romontchi. *Willd.* Madagascar.Rotundifolia. *Roxb.* Corom.Sapida. *Roxb.* Coromandel.Sepiaria. *Roxb.* India.

Flacourtia Inermis, *Tomitomi*, is a very ornamental tree without thorns, bearing a small acid fruit. *F. Cataphracta*,

Panyala, has the trunk and lower branches, often thorny, fruit palatable.

Chaulmoogra Odorata, *Petarkura*. "The seeds of this tree are employed by the natives in the cure of cutaneous disorders. When freed from the integuments, they are beat up with clarified butter, into a soft mass, and in this state applied thrice a day to the parts affected." *Roxb.*

Order 41.—*Turneraceæ*. Lindl. p. 71.

Herbaceous plants, having a tendency to become shrubby, with a simple pubescence, which does not sting. Leaves alternate, simple, without stipules, with occasionally two glands at the apex of the petiole. Flowers axillary, with two bractlets. Petals yellowish, rarely blue. Propagated by seeds or cuttings.

Genus 1. Species 2.

TURNERA. Linn.

Trioniflora. Sims. Brazil.

Ulmifolia. Linn. Jamaica.

Order 42.—*Bixaceæ*. Lindl. p. 72.

Trees or shrubs. Leaves alternate, simple, entire, usually with pellucid dots; stipules deciduous, often wanting; peduncles axillary, with bracts. Fruit yielding Arnotto. Propagated by seeds, cuttings or layers.

Genera 2. Species 3.

BIXA. Linn.

Orellana. Linn. W. Indies.

LUDIA. Lam.

Fœtida. Roxb. Amboyna.

Spinosa. Roxb. Sumatra.

Bixa Orellana, *Lutkun*, yields Arnotto, a species of red dye, formed of the pulpy matter which envelopes the seeds; it is prepared by macerating the pods in boiling water, and leaving the pulp to subside. This plant deserves extensive cultivation.

Order 43.—*Guttiferæ*. Lindl. p. 74.

Trees or shrubs, yielding resinous juice. Leaves without stipules, opposite, very rarely alternate, coriaceous, entire, with a strong midrib, and often with the lateral veins run-

ning through to the margin. Flowers usually numerous, axillary or terminal, white, pink, or red, articulated with their peduncle. Fruit edible, acid, or purgative. Propagated by seeds, cuttings, layers or *goottees*.

Genera 7. Species 17.

CALOPHYLLUM. Linn.	CANELLA. P. Br.
Attenuatum. Wall.?	Alba. Murr. W. Indies.
Inophyllum. Linn. India.	MAMMEA. Linn.
GARCINIA. Linn.	Americana. Linn. W. Indies.
Camboogia. Desv. Travancore.	MESUA. Linn.
Cornea. Linn. Malay Islands.	Ferrea. Linn. Silhet.
Cawa. Roxb. Chittagong.	KAYEA. Wall.
Lanceæfolia. Roxb. Silhet.	Floribunda. Wall. Silhet.
Mangastana. Linn. Malay Is.	XANTHOCHYMUS. Roxb.
Paniculata. Roxb. Silhet.	Dulcis. Roxb. Moluccas.
Pedunculata. Roxb. Rungpore.	Ovalifolius. Roxb. Ceylon.
Purpurea. Roxb. East. Archi.	Pictorius. Roxb. Mount. India.

The species all abound in a viscid, yellow, acrid, and purgative gum resinous juice, resembling gamboge. This gum resin is obtained by removing the bark, or by bruising the leaves, young shoots, or unripe fruit.

Calophyllum Inophyllum, *Sultan-champa*, *Alexandrian laurel*. "The kernels of the nuts of this large and most beautiful tree, have a bitterish, and when ripe, a somewhat unctuous taste. The native Indians, like the inhabitants of the Philippine islands, occasionally prepare from them a fixed oil, which has a grateful smell, and which they highly prize as a valuable external application in rheumatic affections. In Travancore it is much used for burning in lamps—it appears to be from this tree that the resin called *tacamahaca* is obtained." *Ainslie*.

Canella Alba. A very handsome evergreen tree, producing numerous branches of fragrant flowers. "The bark is stimulant, and slightly tonic. It is a useful adjunct to bitters in some cases of dyspepsia and atonic gout, but it is employed chiefly on account of its flavour, and to correct the griping quality of the resinous cathartics. It is said to prove useful in scurvy." *T. L. D.*

Garcinia Cornea. "From wounds made in the tree, or unripe fruit, there flows a yellow juice, which soon hardens into a gum resin of a tolerably good yellow colour." *Roxb.*

G. Cawa. "The tree is of a middle size and handsome; it yields an inferior sort of gamboge, and the fruit edible, though not very palatable." *Roxb.*

G. Pedunculata. "The fleshy part of the fruit which covers the seeds, and their proper juice envelope, or aril, is in large quantity, of a firm texture, and of a very sharp, pleasant, acid taste. It is used by the natives in their curries, and for acidulating water. If cut into slices, and dried, it retains its qualities for years, and might be most advantageously employed during long sea-voyages, as a succedaneum for lemons, or limes, to put into various messes, where salt meat is employed, &c." *Roxb.*

G. Mangastana, *Mangosteen*. This most elegantly ornamental tree, producing the most delicious fruit in the world, is not yet established in Bengal: the individuals to be met with are few, and they have not had the best culture.

Mesua Ferrea, *Nagkasur*. A middling-sized ornamental tree, with delightfully fragrant flowers, which are dried, and sold in the bazar, for medicinal purposes.

The three species of *Xanthochymus* are highly ornamental, and produce a large quantity of gamboge-like gum-resin.

X. Ovalifolius is supposed to yield the best gamboge.

Order 44.—*Hypericaceæ*. Lindl. p. 77.

Herbaceous plants, shrubs, or trees, with a resinous juice. Leaves opposite, entire, sometimes dotted, occasionally alternate and crenelled. Flowers generally yellow. Inflorescence variable.

Genera 2. Species 3.

ANCISTROLOBUS. Wall.

HYPERICUM. Linn.

Cornea. Wall.

Chinense. Linn. China.

Eugenifolia. Wall.

Order 45.—*Ternströmiaceæ*. Lindl. p. 79.

Trees or shrubs. Leaves alternate, coriaceous, without stipules, usually undivided, now and then with pellucid dots.

Peduncles axillary or terminal, articulated at the base. Flowers generally white, seldom pink or red, very rarely yellow. Seeds of some species oily. Propagated by seeds, cuttings and layers.

Genera 5. Species 9.

CAMELLIA. Linn.

Caudata. Wall. Pundua.

Japonica. Linn. China.

Kissi. Wall. Nepal.

COCHLOSPERMUM. Kunth.

Gossypium. DeC. Circars.

GORDONIA. Ellis.

Floribunda. Wall. Martaban.

TERNSTRÖMIA. Mut.

Fasciculata. Wall. Nepal.

Paniculata. Wall.

THEA. Linn.

Bohea. Linn. China.

Viridis. Linn.

The tea which is so extensively consumed by Europeans is produced by different species of Thea and Camellia. The different species have not been cultivated here with any degree of success. Several varieties of Camellia have been introduced, but they have very soon died away.

Order 46.—*Aceraceæ. Lindl. p. 81.*

Trees. Leaves opposite, simple, rarely pinnate, without stipules. Flowers often polygamous, sometimes apetalous, in axillary corymbs or racemes. Sap yielding sugar. Propagated by seeds, cuttings and layers.

Genera 2. Species 3.

ACER. Linn.

Lævigatum. Wall. Nepal.

Oblongum. Wall.

NEGUNDIUM. Raf.

Fraxinifolium. Nut.

Order 47.—*Sapindaceæ. Lindl. p. 81.*

Trees or shrubs. Leaves alternate, compound, very rarely simple, with or without stipules, often marked with lines or pellucid dots. Flowers in racemes or racemose panicles, small, white or pink, seldom yellow. Fruit edible, or saponaceous. Leaves and branches often poisonous. Propagated by seeds, cuttings, layers or *goottees*.

Genera 14. Species 34.

CARDIOSPERMUM. <i>Linn.</i>	SAPINDUS. <i>Linn.</i>
Canescens. <i>Wall.</i>	Acuminatus. <i>Wall.</i> Silhet.
Halicacabum. <i>Linn.</i> India.	Angustifolia.
CARDIOPTERIS. <i>Wall.</i>	Emarginatus. <i>Vahl.</i> India.
Subhamosa. <i>Wall.</i> Silhet.	Detergens. <i>Rorb.</i> India.
COSSIGNIA. <i>Comm.</i>	Fruticosus. <i>Rorb.</i> Moluccas.
Borbonica. <i>DeC.</i> Bourbon.	Polyphyllus.
CUPANIA. <i>Plum.</i>	Rubiginosus. <i>Rorb.</i> Circars.
Sapida. <i>W. and A.</i> Africa.	Saponaria. <i>Linn.</i> W. Indies.
HARPULLIA. <i>Rorb.</i>	Undulata.
Cupanoides. <i>Rorb.</i> Chittagong.	SCHLEICHERA. <i>Willd.</i>
KÖLREUTERIA. <i>Linn.</i>	Pentapetala. <i>Rorb.</i> Silhet.
Paniculata. <i>Lar.</i> China.	Trijuga. <i>Willd.</i> India.
MELIĆCOCA. <i>Linn.</i>	DODONÆA. <i>Linn.</i>
Bijuga. <i>Linn.</i> Jamaica.	Burmänniana. <i>DeC.</i> Coro.
PIERARDIA. <i>Rorb.</i>	Viscosa. <i>Linn.</i>
Dulcis. <i>Jack.</i> Malay Islands.	MILLINGTONIA. <i>Rorb.</i>
Sapida. <i>Rorb.</i> Tippera.	Pinnata. <i>Rorb.</i> Silhet.
NEPHELIUM. <i>Linn.</i>	Simplicifolia. <i>Rorb.</i> Silhet.
Lappaceum. <i>Willd.</i> India.	SCHMIDELIA. <i>Linn.</i>
Litchi. <i>Desf.</i> China.	Dentata. <i>Wall.</i>
Longana. <i>Lam.</i> China.	Serrata. <i>DeC.</i> Coromandel.
Mangifolia ?	
Prolifera ?	
Rubra. Silhet.	
Verticillata. <i>Rorb.</i> Moluccas.	

Cardiospermum Halicacabum, Karavi. "The root of this twining plant is considered by the native practitioners as aperient, given in decoction to the quantity of half a tea-cupful twice daily, it is mucilaginous, and in a slight degree nauseous to the taste." *Ainslie.*

Pierardia Sapida, Lutka. A small tree bearing most delicious fruit, has been in this neighbourhood for upwards of thirty years, and is still almost unknown. The fruit of *Sapindus Saponaria*, and of several other species contain a large quantity of Saponina, and is made use of by the natives as a substitute for soap in washing linen. The wood is of several species durable; that of the Litchi is exceedingly hard.

Order 48.—*Æsculaceæ*. Lindl. p. 84.

Trees or shrubs. Leaves opposite, without stipules, compound, quinate or septinate. Racemes terminal, somewhat paniced; the pedicels with an articulation. Seeds nutritive or saponaceous. Propagated by seeds, layers or *goottees*.

Genus 1. Species 2.

ÆSCULUS. Linn.

Indica. *Coleb.* India.

Punduana. *Wall.* *Pundua*.

The seeds of the horse-chesnut contain starch and potash, they are bitter and astringent. The plants are scarce.

Order 49.—*Polygalaceæ*. Lindl. p. 84.

Trees, shrubs or herbaceous plants. Leaves generally alternate, sometimes opposite, mostly simple, and always destitute of stipules. Flowers usually racemose, very often small and inconspicuous, but showy in many *Polygalas*.

Pedicels with three bracts. Leaves bitter, root milky. Propagated by seeds, cuttings or layers.

Genera 3. Species 4.

POLYGALA. Linn.

Arvensis. *Willd.* India.

Teliphioides. *Willd.*

SECURIDACA. Linn.

Paniculata. *Lam.* Silhet.

XANTHOPHYLLUM. *Rorb.*

Virens. *Rorb.* Silhet.

These three genera exhibit very different habits. The first *Polygala arvensis*, *Meradoo*, is a small herbaceous perennial; *Securidaca Paniculata*, *Ferimjer*, a rambling, or climbing shrub, with numerous flowers; and *Xanthophyllum virens*, *Gundee*, a stately timber tree, with hard, and durable wood.

Order 50.—*Elatinaceæ*. Lindl. p. 88. .

Annual plants, found in marshy places. Stems fistulous, rooting. Leaves opposite, with stipules. Curious plants. Propagated by seeds or division.

Genus 1. Species 2.

ELATINE. Linn.

Ammannioides. *W. and A.* India.

Verticillata. *W. and A.*

Order 51.—*Linaceæ*. Lindl. p. 89.

Herbaceous plants, or small shrubs. Leaves entire, without stipules, usually alternate. Petals fugitive. Seeds oily. Propagated by seeds, cuttings or division.

Genus 1. Species 3.

LINUM. Linn.

Tetragynum. Coleb. India.

Trigynum. Roxb. Gardens.

Usitatissimum. Linn. Cultivated.

L. Trigynum, and Tetragynum are very ornamental little plants.

L. Usitatissimum, *Tisi*, is a valuable annual, on account of its oily seeds, and tenacious fibres, which produce the common flax. "In India flax is cultivated only on account of its seeds, of which the mucilage is valued as a demulcent in medicine, and the oil in the arts; but the plant, which in other countries is most valued, is there thrown away; and others, such as *Hibiscus Cannabina*, and *Crotolaria Cannabina* are cultivated almost in the same field, for the very products which this would yield. It seems worthy of experiment therefore, to ascertain whether a valuable product might not be added to the Indian agriculturist's profits, without much additional expense." Royle.

Order 52.—*Sterculiaceæ*. Lindl. p. 92.

Trees or shrubs. Pubescens often stellate. Leaves alternate, simple, often toothed, with stipules. Inflorescence variable. Seeds oily or mucilaginous. Propagated by seeds, cuttings, layers or *goottees*.

Genera 27. Species 64.

ABROMA. Linn.

Augusta. India.

ADANSONIA. Linn.

Digitata. Linn. India.

ASTRAPEA. Lindl.

Wallichii. Lindl. Mauritius.

BOMBAX. Linn.

Cuba. Linn. W. Indies.

Malabaricum. DeC. Circars.

COMMERSONIA. Forst.

Echinata. Forst. Penang

- BUTNERIA.** *Laf.*
Aspera. *Coleb.* Silhet.
Catalofolia. *Jacq.* America.
Ovata. *Lam.*
Pilosa. *Roxb.* Chittagong.
- DOMBEYA.** *Cav.*
Palmata. *Cav.* Mauritius.
Tiliæfolia. *Cav.* Mauritius.
- ERIODENDRON.** *DeC.*
Anfractuosum. *COROM.*
- ERIOLENA.** *DeC.*
Wallichii. *DeC.* India?
- GLOSSOSPERMUM.** *Wall.*
Velutinum. *Wall.* Mauritius.
- GUAZUMA.** *Plum.*
Ulmifolia. *Lam.* Jamaica.
- HELICTERIS.** *Linn.*
Angustifolia. *Linn.* China.
Elongata. *Wall.* Toong. Doong.
Isora. *Linn.* India.
Pulchra. *Wall.*
Spicata. *Coleb.* China.
Virgata. *Wall.*
- HERITIERA.** *Ait.*
Macrophylla. *Wall.* Silhet.
Minor. *Roxb.* Sunderbun.
- KLEINHOVIA.** *Linn.*
Hospita. *Linn.* Moluccas.
- KYDIA.** *Roxb.*
Calycina. *Roxb.* Circars.
Fraterna. *Roxb.*
- MELHANIA.** *Forsk.*
Hamiltoniana. *Wall.*
- MELOCHIA.** *Linn.*
Pyramidata. *Linn.* Brazil.
- MICROCHLENA.** *Wall.*
Spectabilis. *Wall.* Nepal.
- OCHROMA.** *Swt.*
Lagopus. *Swt.* Jamaica.
- PENTAPETES.** *Linn.*
Phoenicea. *Linn.* Bengal.
- REIDLEA.** *Vent.*
Borbonica. *DeC.* Bourbon.
Corchorifolia. *DeC.* India.
Guazinnifolia.
- PTEROSPERMUM.** *Schreb.*
Acerifolium. *Willd.* Gardens.
Aceroides. *Wall.* Malabar.
Acuminatum. *Wall.*
Canescens. *Roxb.* Ceylon.
Climatidium. *Wall.*
Lanceæfolium. *Roxb.* Silhet.
Semisagittatum. *Roxb.* Chittg.
Suberifolium. *Willd.* India.
- STERCULIA.** *Linn.*
Alata. *Roxb.* Chittagong.
Angustifolia. *Roxb.* Nepal.
Balanghas. *Linn.* China.
Campanulata. *Wall.*
Coccinea. *Roxb.* Silhet.
Cordata. *Roxb.* Circars.
Comosa. *Wall.* Amboyna.
Fœtida. *Lum.* Coromandel.
Fulgens. *Wall.*
Guttata. *Roxb.* Malabar.
Lanceæfolia. *Roxb.* Silhet.
Ornata. *Wall.* Prome.
Pallens. *Wall.*
Parviflora. *Roxb.* Tippera.
Populifolia. *Roxb.* Coromandel.
Urens. *Roxb.* Coromandel.
Villosa. *Roxb.* Bengal.
- RUIZIA.** *Cav.*
Lobata. *Cav.* Bourbon.
- THEOBROMA.** *Linn.*
Cacao. *Linn.* S. America.
- TROCHETIA.** *DeC.*
Eleagnoidea. *Wall.*
- WALTHERIA.** *Linn.*
Indica. *Linn.* India.

These are for the most part very ornamental trees, and are valuable for the oil, mucilage, gum, and cocoa which they yield; as well as for the beauty of their flowers, and the tenacious fibres of their bark, which is capable of being manufactured into cordage.

Abroma Augusta, *Oolut kumbul*, a small tree, with velvet branches and angular leaves. "The bark abounds with strong white fibres, which make a very good substitute for hemp, and as the plant grows so quickly as to yield two, three, or even four crops of cuttings annually, fit for peeling, it may be advantageously cultivated for its fibres which though not so strong as hemp, make good common cordage, &c." *Roxb.*

Adansonia Digitata, *Gudha Ghach*, "or Baobab tree, the trunk of which has been found with a diameter of 30 feet; but its height is not in proportion. It is emollient and mucilaginous in all its parts. The leaves dried and reduced to powder constitute *Lalo*, a favorite article with the Africans, which they mix daily with their food, for the purpose of diminishing the excessive perspiration to which they are subject in those climates; and even Europeans find it serviceable in cases of diarrhoea, fevers and other maladies. The fruit is, perhaps, the most useful part of the tree. Its pulp is slightly acid and agreeable, and frequently eaten; while the juice is expressed from it and mixed with sugar, and constitutes a drink, which is valued as a specific in putrid, and pestilential fevers. The dried pulp is mixed with water, and administered, in Egypt, in dysentery. It is chiefly composed of gum, like Gum Senegal, a sugary matter, starch, and an acid which appears to be the malic." *Lindl., Hook. and Delille.*

Astrapæa Wallichii. A beautiful flowering shrub, not very easily increased except by *goottees*. Scarce.

Bombax Malabaricum, *Shimool*. "The wood is white, light, and spongy, frequently used in India for floating rafts. An astringent gum-resin is yielded by this tree,

called *mochrus*, which, as well as the young roots called *mooslee-suffed*, are considered very strengthening." *Royle*.

Guazuma Ulmifolia. "The fruit is filled with a sweet and agreeable mucilage, which the Brazilians suck with much pleasure. In Martinique the young bark is used to clarify sugar, for which the copious mucilage it yields when macerated, qualifies it. In the same island the infusion of the old bark is esteemed as a sudorific, and useful in cutaneous diseases." *Lindl*.

Sterculia Guttata. "The bark of this tree, the Malabars convert into a flaxy substance, of which the natives of the lower coasts of Wynaad contrive to make a sort of clothing. It derives its name from the process of its manufacture, viz. the chopping the bark into small pieces, *aurayoonoo*, to cut. It is not customary to manufacture the bark until the tenth year, when its size will be equal to that of most forest trees. The mode of obtaining this flaxy substance is as follows. The tree is felled, the branches lopped off, and the trunk cut into pieces of six feet long, a perpendicular incision made in each piece; the bark opened, and taken off whole, chopped, washed, and dried in the sun. By these means, and without any further process, it is fit for the purpose of clothing. For the above account we are obliged to Captain Dickenson, of the Bombay Military Establishment." *Roxb*.

Nearly the whole of the family possess this property of tenacity in the fibres of their bark which may be substituted for hemp or flax. The seeds are oily, but after roasting, edible. The most valuable of the whole order are the seeds of *Theobroma cacao*, or *chocolate tree*; these are remarkably nutritious, and afford a wholesome article of food for all classes and ages. The plant thrives here, blossoms and ripens its fruit. It requires a rich soil, plenty of room, and to be shaded during the first three years after planting. The best method without exception of raising a plantation of fruit trees, is to plant them at a proper distance at first,

and cultivate the intermediate space with annual plants. The chocolate trees should stand 15 feet from each other.

Order 53.—*Malvaceæ*. Lindl. p. 95.

Herbaceous plants, trees or shrubs. Leaves alternate, more or less divided, stipulate. Hairs stellate. Peduncles usually axillary. Seeds wholesome. Propagated by seeds, cuttings, or layers.

Genera	Species.
ABELMOSCHUS. <i>Med.</i>	Lindleyi. <i>Wall.</i> Tavoy.
Esculentus. <i>W. & A.</i> W. Indies.	Longifolius. <i>Willd.</i> Cultivated.
Moschatus. <i>Moun.</i> Courtallum.	Lunarifolius. <i>Willd.</i> India.
Wightianus. <i>Wall.</i> India.	Macrophyllus. <i>Roxb.</i> Silhet.
ABUTILON. <i>Much.</i>	Mutabilis. <i>Linn.</i> China.
Crispum. <i>Don.</i> Coromandel.	Palustris. <i>Linn.</i> N. America.
Graveolens. <i>W. & A.</i> Cawnpore.	Pentaphyllus. <i>Roxb.</i> China.
Indicum. <i>Don.</i> India.	Phonicea. <i>Willd.</i> India.
Periplacifolium. <i>Don.</i> Malay Is.	Prostratus. <i>Roxb.</i> Circars.
Polyandrum. <i>W. & A.</i> Neelgh.	Radiatus. <i>Cav.</i> Gardens.
Tomentosum. <i>W. & A.</i> India.	Rosa-sinensis. <i>Linn.</i> India.
ACHANIA. <i>Sw.</i>	Sabdariffa. <i>Linn.</i> W. Indies.
Pilosa. <i>Willd.</i> W. Indies.	Scandens. <i>Roxb.</i> Chittagong.
ALTHEA. <i>Linn.</i>	Sulphureus?
Officinalis. <i>Linn.</i> Britain.	Surattensis. <i>Linn.</i> India.
Rosea. <i>R. and P.</i> Gardens.	Syriacus. <i>Linn.</i> Gardens.
GOSYPIUM. <i>Linn.</i>	Tetraphyllus. <i>Roxb.</i> Bengal.
Acuminatum. <i>Roxb.</i> India.	Tortuosus. <i>Roxb.</i> India.
Album. <i>Ham.</i> Cultivated.	Trionium. <i>Linn.</i> Italy.
Arboreum. <i>Linn.</i> Gardens.	Vitifolius. <i>Linn.</i> India.
Nigrum. <i>Ham.</i> Cultivated.	LAGUNEA. <i>Cav.</i>
Religiosum. <i>Sw.</i>	Lobata. <i>Willd.</i> Coromandel.
HIBISCUS. <i>Linn.</i>	MALACHRA. <i>Linn.</i>
Albus?	Capitata. <i>Linn.</i> W. Indies.
Cannabinus. <i>Linn.</i> Cultivated.	Heptaphylla. <i>Fis.</i> Brazil.
Chinensis. <i>Roxb.</i> China.	MALVA. <i>Linn.</i>
Diversifolius. <i>Jacq.</i> Madagascar.	Caroliniana. <i>Linn.</i> Carolina.
Eriocarpus. <i>DeC.</i> Circars.	Crispa. <i>Linn.</i> Syria.
Furcatus. <i>Roxb.</i> Bengal.	Hispanica. <i>Linn.</i> Spain.
Heterophyllus. <i>Ven.</i> N. S. Wales.	Mauritiana. <i>Linn.</i> Gardens.
Hispidus. <i>Mil.</i> Cape of G. H.	Polystachya. <i>Cav.</i> Peru.
Lampus. <i>Cav.</i> Nepal.	Pulchella?
Liliiflorus. <i>Cav.</i> Bourbon.	Rotundifolia. <i>Linn.</i> Persia.
	Scoparia. <i>Herit.</i> Peru.

PARITUM. *St. Hil.*

PAVONIA. *Cav.*

Tiliaceum. *St. Hil.*

Odorata. *Willd.* Coromandel.

Tricuspis. *Don.* Otaheite.

Rosea?

Here I am obliged suddenly to break off, being engaged in more important matters; the whole of my time is taken up with them, and I cannot devote any more to this subject at present.—*J. W. Masters.*

May 3, 1839.

III.—*On the Agricultural products of Travancore. The baneful effects of State Monopoly. By E. B. STEVENSON, Esq. of Cottayam.*

[Read at the Meeting on 12th December, 1839.]

It was with much pain I sent you the official letter, because I did not succeed in persuading the Travancore Sircar to subscribe to your valuable Society. The liberality of this Government depends upon the British Resident. See the list of subscriptions from Travancore and Cochin to the Steam Fund. The following, I trust, will give you an idea of the state of trade, &c. in this beautiful and fertile country. The cocoanut is of the greatest value to the country, for nearly a moiety of the revenue I believe is derived from it. Every twelve years (and even for longer periods) the cocoanut trees are assessed, and a year or two before and after each assessment an increase in the cultivation takes place; for if the trees do not bear at the time of assessment, no tax will be demanded until the following assessment: the people, however, lose the benefit in some measure of this liberal regulation, owing to the villainy of the sircar* officers. The trees are divided into four classes: the first pays a tax of one chuckram; second, two; third, three; fourth, four: and the different articles produced by this tree when exported pay five per cent.

* Government.

“tariff valuation.” I think it would be better for the country if the duty were reduced gradually until the minimum of duty was attained, (and perhaps it might go on until it was taken off altogether,) and a fixed rate of export duty placed upon the articles.—There is a fine trade between this country and Ceylon and Bombay in cocoanut oil, coppera and coir, which would increase considerably if it were not for the heavy taxes and impositions of the sircar (Government) officers. Oil is 46 rupees per candy*. Large quantities of rice are exported when the trade is open, principally to Ceylon; but it is an uncertain business in consequence of the Government occasionally putting a stop to the exportation of it without giving sufficient warning to the merchants.

A very large quantity of paddy is grown on the hills, but this cultivation is nothing to what it would be if the tax of 10 per cent. were taken off; and a small export duty placed upon all paddy and rice exported from the country. This would relieve the poor useful cultivator from being robbed and oppressed by the collectors, and they would sell their grain to the best purchasers who are not likely to submit to the extortion of the officers. The 10 per cent. is increased to at least 20 by the time the collectors have done with the cultivators. The cultivation of hill paddy is very speculative, for it is not an uncommon thing for a field to be destroyed in a night by the elephants.

From the place where I am writing, paddy is selling at the rate of $1\frac{3}{4}$ ahdengallies for a chuckram, (this is paddy just cut;) whereas at the short distance of 40 miles (at Thoddarwully) it is selling for two and three ahdengallies for a chuckram, and there is water communication the whole way between the places: so there is no great difficulty in equalizing the prices more than they are at present. Some retail dealers of this place went to Thoddarwully for the purpose of bringing it here, but were prevented after they had bought the paddy and were on their way here with it. Such is the

* A Travancore candy is equal to 600 English pounds Avoirdupois.

way this beautiful and fruitful country is abused. I wish Lord Brougham and Mr. O'Connell could come and see how oppressive the Native Governments are to their own subjects, and I do not think they would be in such a hurry to abuse our Honorable masters. Grain is exported to Ceylon chiefly, and a little is taken to Madras and different parts of that coast: there is an export duty of five per cent. on this, and the same is paid upon every other export except rice, which is free; and all imports are eight per cent, tariff valuation.—Areeka nuts are exported principally into the English Company's districts bordering on this country, and a large quantity is also taken to Bombay. The Areeka nuts that are taken into the Company's districts to the east of this country, are carried through the mountain passes, and the cost of carriage is very great; and in return they bring cloths. It would be a great benefit to this country if the Sircar (Government) were to expend a few lacs of the money they are hoarding up, to improve these passes; there are some that might be made fit for bandees, but unfortunately they think that the greater the number of rupees they can hoard up, the richer the country will be.—The ginger of this country is excessively hot and very small; it is grown in a gravelly soil. It is cultivated in the following manner. A grassy spot is selected and all the grass is cleared and collected into beds of two feet square; this, and the soil that is collected with it, raises the beds about six inches; and after the beds are properly made, 12 places are prepared in each bed for the reception of the ginger which is covered over with about an inch of good soil (brought for that purpose); and before the ginger is taken out, the beds are cleared from weeds, the soil loosened and manured, two, three or four times, according to the industry of the owner: as soon as the ginger is taken up, it is washed and all the small roots scraped off, and then mixed with ashes and put in the sun to dry, which takes nearly a week to perform properly; it is then packed in mats and sent to the sea coast, and there

disposed of to the native merchants who take it to the following places, viz. Bombay, Persian Gulph, and the Red Sea. The cultivation commences in June, and the roots are taken up during February and March.—Pepper is a monopoly. The quantity of pepper received by the commercial agent during the last three years amounted to 14,164 candies, 339½ lbs. The average price of pepper is 68 rupees per candy of 600 English pounds; the average value of this is Surat rupees 8,92,367. But the following deductions are to be made: 1st, the price paid for the pepper by the Sircar (Government) to the inhabitants, is rupees 40 per candy, which gives rupees 5,94,912: 2nd, the permanent establishment, rupees 14,000 a year; (there are other expenses such as packing, drying, repairs of godowns, and shipping the pepper, an account of which I cannot get any information upon,) and 3rd, the expense of the pepper collectors, of which there are three in each prowartie, and there are about seven prowarties in each district. But there are only 29 districts in which the pepper grows. The pay of the pepper collectors is as follows: Cashkeeper, rupees 5; Writer, rupees 3½; Weigher, rupees 3; Total, rupees 11,8. These persons are employed for six months at a time, therefore the total expense for the six months is rupees 14,007, and for three years makes 44,021 rupees, so that the total expenses for three years is rupees 6,80,933, leaving a balance in favour of the Sircar of rupees 2,11,434 ÷ 3 = rupees 70,478 per annum. Whereas if an export duty of six rupees per candy were put upon the pepper, it would be in a very short time recovered; for the revenue would only be decreased rupees 13,475 a year. The pepper vines are grown (I cannot say cultivated) in the following manner. The Sircar officers distribute cuttings to different houses, and the owners are obliged to plant them, but no further care is taken of them: (the instances to the contrary are very rare) and in three or four years they bear. The proprietors of the gardens in which pepper is grown are obliged to carry the produce to the Collector's cutcherry,

where they get or ought to get 40 rupees a candy, and the collectors cheat them also in the measure. During the pepper season the collectors and others improve wonderfully. Steps were about to be taken, when Colonel Fraser was Resident in this country, to do away with this monopoly; but unfortunately for this fine country he was removed to the Residency of Hyderabad before he had time to carry the measure into effect. I have been informed by a person well acquainted with the pepper trade, that about one-sixth of the produce is smuggled into the town of Cochin for exportation. A report got abroad that the pepper monopoly was to be done away with, and in the neighbourhood of Cottayam many pepper cuttings were put down in consequence. If the monopoly were done away with altogether, there certainly would be a very considerable increase in the produce. Cardamums are produced in this country: it is also a monopoly. The method adopted in cultivating the cardamums in this country is as follows. A piece of land is looked out for, on which a tree called the cardamum tree grows: the first year the low jungle is cut down and allowed to rot on the ground; the second year a few large trees are felled; in the third year the cardamums make their appearance, and in the fourth year the first crop is gathered. Further information will be seen in Porter's Tropical Agriculturist. I have made frequent inquiries about burning the jungle as mentioned in Porter's work, but it is positively denied by all the people attached to the cardamum department, excepting the gentleman at its head. The expenses of this department are, I believe, rather more than 60,000 rupees a year. During the last three years there has been exported 10,611 candies, which was sold for (average price) 384 per candy, which gives nearly 3½ lacs clear profit a year; but the price is falling. This monopoly gives employment to several thousand coolies, even so many as 8 or 10,000 but they are people from the (English) Company's country. Cardamums, not many years ago, were sold by the Sircar for

1,000 rupees a candy ; and within the last five years it still was sold for 600 rupees per candy, but it is now even less than the price I have mentioned above. I have known it to be sold for as low as 300 rupees per candy. Teak and blackwood are both monopolies : the latter has been made so only lately ; the former has existed for many years and realizes considerable profits.—Colonel Fraser formed a tobacco plantation under a European, which was going on tolerably well until he left, when the opposition became too strong to hope for success. It was proposed to the dewan to reduce the price of the tobacco, until the profits were fair and just, and then to give up the monopoly and put an import duty upon the article, and allow the people to cultivate it. It was approved of, but not acted upon. The price of the tobacco purchased yearly by the Sircar is two lacs, which they retail for eight lacs. The tobacco monopoly is the cause of a great deal of smuggling and oppression to the people. The great obstacle in doing away with the monopolies, is the profit that certain people in the palace and huzoor cutcherry, and those belonging to the different departments of monopoly derive from them. Even in tenders there is a great deal of roguery, for the tenders are opened long before the time advertised for doing so arrives. A Bombay house last year tendered for pepper or some other article, and much to their surprise a copy of their tender was handed to them, before the time for opening the tenders had arrived.—In January 1838, I commenced a Sircar Silk establishment and was getting on very well, when to my great astonishment, on visiting the establishment one day, I found about 20,000 fine young mulberry trees which had been sent to me by the Rajah, pulled up by the roots and laying in the compound. I had planted them in one of his gardens a few months before, by his own permission. I mentioned this to the Resident, Captain Douglas, but I got no redress. I then applied for some waste land about six miles from the establishment : it was promised me

both by the Resident and the Dewan, but after writing and speaking to both parties and receiving nothing but promises, I at last was informed that the Sircar was too poor to go to the expense of laying out a plantation. You may suppose how annoyed I was with receiving this reply for the establishment was getting on remarkably well. I had produced silk worth eight rupees a pound, which had been reeled by boys who had to be instructed, and during the first year I produced 45 lbs. I am still persisting, and I am hoping against hope, that some favourable circumstance may occur to bring forward this branch of agriculture. In some parts of Travancore silk may be produced advantageously all the year round, and in every part of it for 10 months, that is from August until the end of May, when the very heavy rains set in. The Chinese reel of 47 inches in diameter and six spokes is used in the filature. The cages or stands on which the silkworms are fed, are of the following dimensions: H. 9 ft. 4 in.; L. 13 ft. 1 in.; B. 4 ft. The length of these cages may of course be more or less, according to the length of the room, but a greater height or breadth would be inconvenient. The cages are divided into nine tiers, six for feeding the silkworms on, and three for spinning. Each feeding tier is divided into six compartments, and capable of holding two feeding trays, which gives 72 trays. The cocoon tiers are divided into 18 compartments, that is, six for each tier. The feeding and cocoon tiers are one foot apart.

Feeding.—The worms, when first produced, are placed in wooden trays about $\frac{3}{4}$ of an inch deep and 2 feet square, until they have changed a second time, when they are placed upon nets, which have leaves ready spread over them and are placed upon the wooden trays. The worms are cleaned twice a day and sometimes thrice, and fed when found necessary; and the worms are never touched after they are removed to the net, until they are moved to the cocoon trays, excepting those that have not crawled up to the fresh leaves.

Nets.—The trays, as above mentioned, are two feet square, $\frac{7}{8}$ of an inch deep, and to each pair of trays there are three frames to stretch the nets upon. The nets having been stretched upon the frames and fresh leaves spread upon them, they are placed upon the trays, and the worms soon find their way to them. When the boy has placed the frames upon the tray, he leaves it, and goes on to the second and third, and so on until he has completed the whole; he then returns, removes the dirty tray and replaces it with a clean one, and removes the few worms that remain, if they are healthy, and so with the others. Two boys are employed in shifting the trays. The dirty trays and nets are taken away by a third; and the three boys will take care of five cages of the above description. The sickly worms always remain underneath and therefore do not require the time and trouble of separating them. The frames are frequently lifted up to allow the foul air to escape. I shall send you a specimen of the silk produced in Travancore*, but please to recollect that the establishment only commenced rearing worms in April 1838, and the silk I send you is reeled by inexperienced boys. I will also send you some silk produced by the Jews, which I think is of a very superior quality, but very badly reeled; if I am right, time will rectify the bad reeling. This establishment may be said to have only commenced last February, and there are now upwards of 14,000 mulberry bushes capable of supplying at least 7000 lbs. of leaves. So congenial is this climate to the mulberry. A fine young nursery was destroyed by the Resident, which is a sad loss, not so much on account of the trees, for there were not above 100, as of the effect it is likely to produce; for the Cochin Sircar will conclude, from the circumstance of the Resident having destroyed the nursery which Colonel Fraser took so much trouble to form, that he (Captain Douglas) does not care about it.—When Colonel Fraser was here, he persuaded the Travancore Sircar to distribute coffee plants free of all

* Not yet come to hand.—*Secretary.*

charges to the inhabitants, and one lac and thirty thousand were purchased for that purpose last year; but I unfortunately committed a great mistake in purchasing and distributing them when they were too young; and the season was terribly against me, so it has not proved so successful as could have been wished. The present Resident told me that the Sircar had sanctioned the purchase of five lacs more, but I regret to say that the Sircar has refused to let me purchase a single one. If five lacs of two years' old coffee plants had been distributed this year, the second year after transplanting the coffee plants would have produced a small quantity of fruit, enough, to have encouraged the inhabitants to pay attention to them, and they would soon have commenced cultivating it themselves. It would have been an excellent thing for the country, for the Bordeaux merchants consider it equal to Mocha coffee; and as very full instructions regarding the method of cultivating and drying it have been distributed amongst the people, I have no doubt but they would attend to the cultivation of it. There is a small quantity cultivated in the district of Quilon and in some other places. On the banks of the Allwaye river (about 17 miles north of Cochin), a few plantations are being formed by Europeans: their example may be of infinite benefit to the country, for as soon as the natives see that money is to be made by cultivating coffee, they may cultivate it themselves. But there is one great obstacle against it; that is, the natives have no confidence in the Government, for they fear having to pay some duty for the trees. Although they were repeatedly told they would not, and the dewan's signature to the order was shown to them, they would not believe it; yet the order is printed with the instructions and the official signature of the dewan affixed to it. I send you a maund of coffee which I hope you will do me the favour to accept, and in return please send me your opinion upon the quality of the articles I send you*.—I have tried to induce the

* Not come to hand.—*Secretary.*

Sircar to employ some Mysore sugar manufacturers, but it did not receive the support of the Resident, (although he approved of it,) and therefore it was not sanctioned. This is a great pity, for there is abundance of land in this country that is unfit for any other cultivation, and the abilities of the natives only extend in this valuable art to making what I think is called in Bengal *goor*. I do not give up all hopes of success, and shall try what I can do towards effecting this desirable object with the assistance of books. This country is supplied with sugar principally from Bombay. The Bombay Society sent me 50 Mauritius sugar-canes, but unfortunately they were so long on their voyage, that not a single cutting has succeeded. I wanted to introduce the Persian method of cultivating cotton into this country, and wrote to the Resident upon the subject. I have not received any answer, and the season for planting is now over. I also wrote to him to send me some guinea grass, when he arrived at Courtallam, but he forgot it. I am most anxious to obtain this, for I may almost say that there is no fodder in the country for two or three months in the year. I have made two other attempts to obtain it, but have failed.

In the early part of this year, I met with a pensioned bombardier who understood weaving as it was known in Ireland (his native country) 20 years ago, and I have given him some looms to go on with; but unfortunately he is not so industrious as could be desired, and he occasionally drinks: but he is not altogether useless, for he is teaching some weavers of this place that I have sent him, and they are getting on very well, so that I hope to be able to set them up with four looms in November next. I find that the thread made in this country will not answer for weaving with the English looms; for the thread in some parts is very little better than the wool, and in others so tightly spun, that it breaks with the slightest strain. I have therefore written to Bombay and also to Madras, requesting a house of agency to send a few bales of cotton yarn upon speculation,

which I am sure will sell well ; for the average price of thread in this country is 14 annas a pound, whereas the English I find is 10 annas. This is the average price of seven different kinds of thread, that is from 20 to 80. I have sent the prices of thread to Bombay, so I hope they will send some bales. I cannot afford to buy any myself ; for my subaltern's pay will not afford it, and yet what little good I can do, while I remain in this country, must be done out of that, unless I succeed in all my undertakings beyond a reasonable expectation.—I have made up an horizontal sugar-mill after the plan of one given in Porter's work ; it is very defective, for the pinion wheels are inside the frame : it is necessary that they should be put outside, to prevent the grease from the wheels falling into the cane juice ; this will increase the difficulty of working it, but an extra bullock will be able to overcome the obstacle. I have had applications for the model from different individuals, to get working ones made up ; I am glad of this, for it shows that the new mill is approved of, and all that is now wanted, is a few people from Mysore to teach the sugar-cane planters the method of making sugar.

This country is the most favoured land in India as to water communication. All the way from Trichoor to Trevandrum, a distance of upwards of 200 miles, there is an uninterrupted water communication, excepting in one place where it is interrupted by a low range of hills, over which there is some talk of having a railroad. I hope it may be the case, the distance is only six miles. The greatest part of the water communication is formed by backwaters which run several miles inland, and are connected by canals ; but I am sorry to say that the communication is frequently obstructed by sand banks and logs of wood. There is only one road in the country that will admit of bandies, which is about 60 miles long. It commences at the Arumboola pass near Nagercoil and Rotar, but it is in a wretched state ; there is also a branch road from this about 9 or 10 miles, which I believe is in tolerable condition. When General Fraser was in the

country, he intended to have had the roads repaired and new ones made, and the water communication improved; but since he left, there has been nothing but talking, and I fear, nothing will be done for the improvement of this country for a long time to come. At almost every 15 or 20 miles there is a fine river, navigable for 20, 30 and 40 miles inland during the greatest part of the year, whilst the average breadth of the country is not more than 50 miles; but with all these advantages there are many acres of fine land lying waste. There are hundreds of acres of rich land covered with a dwarf teak, which must not be cut down, because teak is a monopoly, and from which scarcely a tree a year is cut down: so much for monopolies. I have not written sufficiently in praise of this fine country, for it requires a better pen than mine. The revenues of this country might be doubled and quadrupled in a short time, if more attention and encouragement were given to trade and agriculture. All the agricultural labour, or nearly so, is performed by slaves, who are miserably provided with the necessaries of life. The price of an able-bodied man is 17 rupees. and of a woman 13 rupees.

Cottayam is due east of Allipie about 20 or 25 miles; it is spelt in various ways; for instance, Cotayam, Kotium, and Kottayam.



OF THE
JEE TREE

Asiatic Lush Tree (Asiatic Lush)
T. Black Lush

আসিয়ার লুশ ট্রী

IV.—*On the Mezangurree Silk of Assam and the plants whereon the worm feeds.* By MUNEERAM BUA BAN-DARREE BARROOA.

[Read at the Meeting on the 9th April, 1839.]

I have the pleasure of forwarding for the Agricultural Society an original paper by Muneeram B. B. B. on the Mezangurree silk of Assam, with a translation made by Mr. Bruce, junr. It appears that the correct name of the silk is as above, and that this has been improperly applied to the *Tetranthera*, which you suppose to be *T. Quadriflora*, the name of which is *Adahkoree*.

With this account I have to submit five pieces of the cloth, sent me for this purpose by Muneeram. They are ordinary pieces, nothing particular, but much better can be made of the silk. You will see from the notes at the foot of the paper, the comparative value of this silk in the eyes of the Assamese gentlemen; its value is chiefly in its great strength.

I have sent you numerous specimens of the *Adahkoree*, and I hope you will be able to exhibit one with the paper. Last year in proceeding to Borhath, I saw great quantities of this plant above Ghergaon: in that direction it is chiefly found. It is very scarce in lower Assam, and I believe is found to give very inferior cocoons.

F. JENKINS.

Gowhat, 20th March, 1839.

This silk is produced in Assam, but particularly on the banks of the river Dekhow in Jagtullee, Galakee, Ahtkhel, and other places. A little may perhaps be produced elsewhere, but it will never be equal in quality or quantity to the produce of the above places.

The mode of culture is as follows:

1st. The jungle is felled in *Kartick*, (Oct. and Nov.) and should be a thickly-wooded one. On the trees drying they are burnt, and the ground is broken up and sown with *Ouse dhân*. Along with the rice the *Adahkoree* plant, on which the caterpillar feeds that spins the Mezangurree silk, springs up indigenously. In Jeyte and Assar the paddy is cut

down, and the Adahkoree plants are left to grow. In a short time they attain strength, but they must be protected from wild beasts. In Jeyte of the next year the worm is put on these trees. The Mezangurree caterpillar is not a different species from the moogah, but it must be selected from different day's cocoons.

The real moogahs, that is, the first and last days' cocoons, will not answer, but the fourth and fifth days' cocoons are the best, and the seventh and eighth day's cocoons will also answer well. These are selected and kept in a bamboo basket. In fifteen or sixteen days, these cocoons burst, and the moth is created: these are generally in pairs, and on their uniting they lay eggs. The females are taken and tied slightly with a cotton thread, when a male is put to each. If the males and females all unite, then the moogah will be a plentiful crop; but should the females be in greater numbers than the males, then they are taken, and after a cotton thread is tied round them, left exposed for the night in the open air, either over a pool of water or some branches of trees; and, what is most surprising, from some place or other the males come and unite. In the morning they are taken up and carried into the houses and suspended on a rope. If the males do not come and unite, or should there be too many males, in these cases it is well known the crop will not be plentiful. After the males and females have been together for three days, on the evening of the fourth day a small torch of fire is shewn them, when the males separate and take their departure, the females remaining on the hanging straw rope to lay their eggs. After the females have been laying for three days, the strings which bound them are cut, and they are released. In the hot weather the young worms are hatched in nine or ten days; in mild weather, in eleven or twelve days, and in the cold weather, in twenty or twenty-five. On the appearance of a few of the young worms on the straw rope, it is taken out and they are hung up on the Adahkoree trees. On the young

insects smelling its leaves, they climb from the straw rope to the tree, and begin feeding, and the remainder of the eggs are left on the trees for three days, and as they are hatched, they also go to the leaves. All the other eggs in the houses also are hatched in five or six days, and are taken and put on the trees on the first appearance of the young caterpillars from any of the eggs early in the morning of the first day, the remaining eggs being hatched on the trees. It may be ascertained, if the crop will be successful or not, by watching the time taken in hatching:—if in as many days as the eggs were laid, the worms are hatched and settled on the trees, it is a good sign; but if many days elapse in the hatching, or a large quantity of the eggs remain without being hatched, it is a bad sign, and failure is certain.

From the day the insects are put on the trees, they are watched, and the pellet bow used to protect them from the birds, or otherwise they would be destroyed. The following must be particularly observed, or the crop will fail. The individual that puts the insects first on the tree must not use his razor for 45 days, nor eat fish, milk, nor the *Bhole**. After the lapse of five days from the day the insects are born and put on the tree, they drop their *Krisnochall*, or infant skin, and commence growing. They are then called *Chāer oorooh poloo*. After five days more feeding they drop their second skin; they are then called *Dur kotah poloo*. After five days more feeding they drop their third skin; they are then called *Teeneer kotah poloo*. After five days more feeding they drop their fourth skin, when they are called *Bor Chall kotah* and *Mykeer kotah*. After this, in ten days further feeding, they attain their full growth, and on the lapse of this term they fast one day and remain with their heads downward; when they are called *Jāmah-looah*†. About 4 o'clock they discharge all their dung and urine: this is called *Jārāmkorah*‡; and after this, in the evening, they come down from the trees, and form themselves into ripe worms at its foot. At night two or three

* The sweet *torae* of India. † Taking a cloak. ‡ Purifying.

people go with torches, and picking them up, bring them away in bamboo baskets. On taking them home they get bamboo *Seengoree* and *Deglothes* leaves and branches, and, tying them in branches, put the ripe worms on them; when the worm, for three days, throws out silk from its mouth and forms its cocoons. These cocoons are taken and put into a solution of weak lukewarm potash; then five or six fibres of the silk are drawn up and put together, and the silk reeled off with tools called *kahurah-sallee* and *bhownurree*. This operation is performed by two persons. The fewer the cocoons reeled off at a time, the finer the silk is, the greater the number, the coarser the silk; but when silk is reeled for the purpose of sale, thirty or forty cocoons are reeled off together to lessen the labour. The finest white silk is from new trees; and though the silk worms can be reared on the trees for two seasons, yet on the older trees the silk is darker. On this account, only two crops are reared on the same plant.

The Mezangurree and Moogah is most plentiful in Jeyte and Bhaudur, called the *Jeytooah* and *Bhodeah* crops. Besides this, there are five different crops of moogahs, viz. khoteah, jorooah, jatooah, aharooah and bhodeah. Of these the hot weather crops are reared the easiest, and with less labour; the cold weather crop is the most difficult. The aharooah and bhodeah crop are much sought by crows and birds, so that double watchmen must then be had recourse to.

NOTES.

The khotèah crop yields less silk, but it is the finest in color and most valuable, from not being exposed to the rains. The crops of the rainy season are plentiful, but the silk is far inferior in color and strength.

The produce from 1000 cocoons is generally estimated at 20 tolahs of silk, nearly $\frac{1}{2}$ lb.

The price of common moogah silk in thread is from 3 to 4 Rs. per seer of 80 tolahs, but the Mezangurree fetches from 6 to 8 Rs. per seer, whilst the silk of the true mulberry worm is only valued at 5 to 7 rupees.

V.—*On the Agricultural Capabilities of the Island of Penang.*

. By JAMES R. LOGAN, Esq., of Glasgow Estate.

[Read at the Meeting held on the 11th December, 1839.]

A short time ago, I came from Bengal to assist a gentleman here in the superintendence of an estate of nearly 10,000 acres, including about half the cultivated land of the island. Of this I found 800 acres of spice plantations; 1000 acres of paddy land; acres of cocoanut and betel topes and orchards of dorians, mangusteens and other fruit trees; acres leased to Chinese and Malays as garden ground, but in which indigo and sugar-cane are raised along with kitchen vegetables, while the remainder of nearly acres was covered with dalang (ooloo ghas), or still in a state of jungle. To bring this waste land under cultivation, to improve the native practice, to introduce new plants that may be useful, either in a commercial view, or as varying, multiplying, and bringing down the price of articles of native consumption, and generally to explore the resources and advance the agriculture of Penang, are the objects that induce us to apply for aid and advice to Dr. Wallich. I have already written to several friends in the Mofussil for supplies of all plants grown by the natives of Bengal, very few of which are known here but as articles of importation. Vegetable oils, for instance, are much used and brought from Madras and Calcutta, but the plants that yield them, raece, soresse, teil, moisna, &c. are unknown to the Malays. Legumes, so common on the plains of Bengal, gram, kalai, moong, are not seen growing here, though they may be bought in the bazar sometimes at four and six times the price they bear in the Mofussil. Few of the vegetables any Bengali malee can raise, have a place in the gardens. Indigo, which might be cultivated to any extent and imported to Europe and America, is only a garden plant; the cost of

average indigo here would not exceed 50 rupees per maund, which is far below that of the cheapest made indigo of the Bengal factories. As there are neither droughts nor inundations in Penang, there would be no risk. We can cut the same plant three, and if manured, (which costs little,) five times in twelve months for the Bengal planter's single cutting, which will more than counterbalance the difference in the price of labour, though it is that of $2\frac{1}{2}$ rupees or 3 rupees and $5\frac{1}{2}$ rupees. Mulberries, which form such a valuable part of the Bengali ryots' cultivation, and the silk-worm, which gives such profitable employment to the village women and children, are not found here.

We are desirous of giving every plant of the East a fair trial of Penang soil and climate, previous to any attempt to induce the natives to take up any new cultivation. I am confident this island has naturally a much wider botanical range than Bengal; the combination of hill and plain, and the diversity of its soil alone must give it greater scope: the comparative barrenness of much of the soil is more than compensated by the perpetual succession of warm sunny days of equal temperature, and frequent showers, which causes an astonishing quickness and luxuriance of vegetation. Perhaps there are some things that Bengal might borrow of Penang. Amongst the various kinds of trees that cover the hills, there are several remarkable for colour and hardness, and some that yield dyes and drugs. Of the 150 species which are known to be in the jungles, there may be some that have not yet found their way into the Botanical Garden: I shall have much pleasure in sending you specimens and seeds of any of these. Many are covered with fine flowers and fruits, and I have nowhere seen forests where the leaves and the forms of the trees were so diversified. There are several varieties of sugar-cane which I never met with in Bengal. Some oil plants and vegetables are also I think not found in Bengal. I send a small box of seeds of fruit trees. Several of these have already had an unsuccessful

trial in India, I believe ; but care and perseverance may bring some of them forward. Would Dr. Wallich wish young plants in preference to seeds, I will supply him from our nurseries, if he will mention the age best fitted for transportation, and the way in which they are to be transmitted. There is such a variety of climate and soils within the compass of Mr. Brown's estates that I think it might be advantageous to intrust us with a portion of the Society's supplies of seeds. Every attention would be paid to instructions, and the results communicated to the Society. It was proposed a short time ago to form a small Agricultural Society here and an experimental garden ; but as there are ample means within the Glasgow estates to experiment on any scale, and as the interests of most of the merchants who have engaged in planting, is limited to their spice plantations, we did not see the advantage in having a Society the members of which would be exclusively engaged in town business, and would take little interest in our schemes. Besides, an estate that includes so many varieties of soil, exposure, elevation and climate, and extends to every district of the island and to the mainland, has advantages for a wide range of experiments applicable to and calculated to benefit the whole island, which no single experimental garden, such as it was proposed to establish, could possess.

Nothing struck me more after seeing the fine vegetables that are every day placed on the Calcutta dining tables, than to learn that in all Penang there is not a garden deserving of the name : every visitor from Bengal must have noticed the vegetable deficiencies of the Penang dinners. It only requires a successful example to induce the merchants to pay some attention to improve our vegetables, and bring new varieties from Calcutta.

The cattle of the island are fed almost entirely on coarse *aloo* grass. There could not be a more benevolent gift than some cuttings or seeds of guinea grass. The island is overrun with Sumatra ponies. Palkee stands are on every road-

side. Every hour of the day they pass Glasgow filled with the poorest natives. And certainly any nourishing grass that would hide the bones of the ill-used and over-wrought ponies, would be a blessing to Penang.

A few cuttings of mulberry would be very acceptable, as I cannot depend on the small quantity I got from Captain Low. I have written to Bengal for silk-worm eggs, but I am very doubtful of our succeeding in introducing silk amongst the Malays.

Do you think the Bengali practice of covering in the *pan* gardens has any other purpose than that of screening the plant from the hot sun of May and June? and would it be of use in Penang? It strikes me that the betel leaf here (which is grown in the open air), produces fewer, smaller, and less green and juicy leaves than the plant in Bengal. As this is the great luxury of the natives of all classes, and above 30,000 dollars' worth are sold in this settlement yearly, I should be glad to shew them any way of improving the size and quality of the leaf.

It is almost impossible to get a good mango here, and indeed it is seldom that mangoes of any kind can be procured. The trees all become blighted from some cause not yet ascertained—the leaves wither—the branch rots, and nearly every tree in the island has its smaller branches leafless and broken.

The *tuka bitong* seems to grow as large as the Otaheite canes in the Botanic Garden, 9 and 10 feet is a common length of stem. There are now 11 canes growing from one stole beside a Malay near Glasgow house, two of which are 14 feet, and three 15 feet high from the ground to the uppermost joint. Many have been found weighing 14 lbs. Azer Etam valley is now the field of a great experiment in sugar planting. About 50 acres are planted, and 100 more are nearly ready for planting.

The coffee cultivation has fallen off greatly, but it is now being renewed on a more extensive plan than before.

Very fair cotton has been raised at Singapore by Mr. Crane. Do you think Penang suited for it? Cart loads of shrimps and other fish are applied to the poorest soils and give the richest crops: I suppose this might do for cotton.

Tobacco is not grown; our large tracts of red soil might suit it.

Pine apple grows so abundantly that orlongs together of it are met with in all directions abandoned and choked with ooloo grass. Mr. Brown had some of the fibre prepared some months ago and sent to England.

Atap, a plant that shoots up into 6 or 8 palm-like leaves in the salt swamps along the shores of Penang, is universally used for roofing houses, when tiles cannot be afforded, and the entire hut of the poorer Malays, save the frame-wall, is made of it. Notwithstanding the abundance of ooloo and other grasses used in Bengal for thatching huts, the poorest coolies prefer paying 3 dollars a thousand for ataps: the great recommendation is its being so much less combustible than any grass or other leaf. Besides it is much more cool, dry, and neat, than heavy grass thatch. It keeps out the rain more effectually, and there is no unhealthiness engendered by the damp remaining in it. It might be grown in sufficient quantity towards the salt water lake to supply all Calcutta and supersede the heaps of grass and dried water plants, which in the rainy season remain soaked with water, and in the hot render the poorer native part of the city a mass of combustibles which any chance spark may set in a blaze. One orlong (four bigas) of ataps will yield, after five years, a yearly profit varying from 30 to 50 rupees.

A mercantile house of this island has prepared a piece of ground of above 100 acres for a sugar plantation: 40 acres were planted with the common cane of Penang nearly 4 months ago. Some of this cane shews a surprising growth, being now 8 feet high, with from 4 to 5 feet of well developed cane. Other speculators only wait to see the result of this first extensive experiment, before engaging largely in a cul-

tivation which promises to be so profitable, and would become much more so, were the home market open to us as it is to India. We are desirous, before the cultivation is carried farther, of being informed whether any other cane known in Bengal may be substituted with advantage in our plantations. These canes were cut to-day from one stole; 4 canes of lesser growth still remain, and some canes were a short time ago cut from the same stole. These canes now measure and weigh as follows.

1st Bundle, large canes.

2 canes, weighing, when stript of leaves*,	28 lbs.
Height from lowest to highest developed joint,	16 feet.
„ to highest shoot,	19 „
Girth near root,	7½ inches.
„ 6 feet from root,	5¾ „
„ 12 feet „	5 „
3 canes, weighed,	37 lbs.
Height to highest joint free of leaves,	15½ feet.
Entire height,	17½ „

2nd Bundle, ordinary canes of 10 months' growth.

3 canes, weighed 28 lbs. and have 10 feet 8 inches of good cane; girth at lower joint, 5 inches; 6 feet higher, 6 inches.

5 canes from one stole are tied up with thread.

3rd Bundle, canes of 8 months' growth.

4 canes from one stole 9½ feet in length, weighed 30¾ lbs.
and

4 canes from the same field, weighed 28 lbs.

21†

This field was selected from a number of cane fields in a tract of very fair, though perhaps oversandy ground in the

* The extraordinary size of these canes is owing to the liquid manure with which they were plentifully supplied.

† These were received by the Agricultural Society.—H. H. S.

district of Soongie Neebong, bordered on two sides by the salt water of the mangrove jungle. For the purpose of forming a rough estimate of the return the Chinese get from this cultivation, I made an approximation to the number of canes an orlong (4 bigas, or an acre and a third) may produce, by having three rows counted.

1st row, 40 stoles, 282 canes.

2nd „ „ 325 „

3rd „ „ 300 „

There are 10 rows, 6 feet apart, which at 300 canes on each row, is 3000 canes on a piece of land 120 feet long by 60 feet broad, the eighth part of an orlong or half a biga. An orlong of such cane is worth 240 dollars, and a biga, more than 120 rupees. The rent of the ground is 2 dollars an orlong, and the whole expence could not exceed 40 dollars.

These canes have been well manured, chiefly with fish, and may be received as ordinary specimens of the canes raised by the Chinese planters of Penang.

You would very much oblige me and many other residents here, by informing us whether you know a better kind of cane than that sent, and could oblige us by a few cuttings of the Otaheite cane for seed.

There is an estate of 10,000 acres in this island, with which I am connected, and as the attention of Europeans here has till lately been confined to spice planting, considerable tracts remain in a state of jungle, or covered with ooloo grass. There are only 800 acres of spice trees, the remainder of the cultivated land consisting of paddy fields, orchards of mangusteens, dorians and other fruit trees, cocoanut and betel topes, gardens &c. Coffee is grown to some extent too, and there is no doubt that every staple article of eastern husbandry might be produced in Penang. But no one has yet devoted his time to the improvement of our agriculture, and the consequence is, we have neither seeds to sow, nor do we always know the best way of cultivating new plants. If you would favour us with small supplies of

the seeds at the disposal of the Society, such as cotton, tobacco, mulberry cuttings, grass seeds, sugar-cane, hemp, garden vegetable, and fruit tree seeds, you would confer the greatest boon on Penang and lead the way in introducing new and profitable plants into this part of the world. We shall at all times be happy to supply the Society with seeds of Penang plants in any quantity. Should young plants be preferred we shall be happy if you will draw on our nurseries for young nutmegs, cloves, coffee, betel, dorian, mangusteen, chumpada, rambootan, rambae, hunka, jampoonie, jampooie, or other fruit trees planted here*.

Glasgow, Prince of Wales Island, 27th August, 1839.

I have put in the case a few canes of the black, red, and yellow kinds, they are not common, but you must not judge of them by those sent, which were only taken as being found close at hand, and are much inferior to most canes of the kinds I have seen,

28th August. I have this moment had 11 canes brought in from a field in Soongie Neebong, of better soil than the tract where the others were cut: the five tied together are from one stole and have now 10 feet and more of hard cane, the length, including upper tracts, is 14 feet, they are *ratoon canes of less than FOUR MONTHS' growth*. I have watched this field since the canes were 2 feet high, and neither in Bengal nor Penang have I ever seen such rapid and luxuriant growth. The stoles bear from 6 to 19 canes each, 9 or 10 may be taken as the average, though I found the commonest number to be 12. At this rate there must be about 60,000 canes on the field as it is nearly 8 bigas in size. I do not wish this to be taken as an average of Penang cane

* Dorian, *Durio Tebethinos*. Mangusteen, *Garcinia Mangostana*. Chumpada, a species of *Artocarpus*. Rambootan, *Hephelium lappacuna*. Rambae, Species of *Lansium*. Hunka, the jack tree, *Artocarpus Integrifolia*. Jampoonie, *Eugenia Mallaccensis*. Jampooie, *Eugenia Agnea*.—H. H. S.

crops, but as an instance of the higher return a Chinese labourer's industry, care and knowledge bring him, compared with the results of a Bengal ryot's indolence and pernicious practices.—J. R. L.

VI.—*Note on the mode of preparing the Raw Silk for which the Gold Medal of the Society was awarded. By W. G. ROSE, Esq.*

[Read at the Meeting on the 13th November, 1839.]

With reference to my letter of the 28th June last, I have now the pleasure to wait on you with the particulars required by the Committee, respecting the sample of competition silk sent by me to the Society. The sample in question was reeled, according to the native mode, from the “Burra Polu” or large cocoon, supposed to be the Italian ; it took an average of $10\frac{1}{2}$ kabons of 13,440 cocoons, weight seven seers, to make a seer of silk, which at the cost of 14 pun or 1120 cocoons per rupee, gives Company's Rupees 12 per factory seer ; to which add 2 for expences of reeling, &c. and the cost of the article is Company's Rupees 11 per factory seer, as stated in my letter of 16th April last. The worms that formed the above cocoons, were reared after the native fashion. The mulberry on which the worms were fed, was grown in light soil, mixture of sand and clay, and cultivated exactly according to the native method.

You ask me to embody my experience in the form of a paper. I had partly delayed this communication so long, for the purpose of doing so, but find that there are already some very capital papers on silk in the Transactions of the Society, and a very detailed account of the culture of silk in Bengal by Mr. D. W. H. Speed (vide vol. iii. page 13 of above Transactions) to which I could add nothing.

As regards the cultivation of mulberry, Mr. Speed states that "the best soil is, an even admixture of sand and clay," this I believe to be correct so far, that mulberry grows, perhaps, more luxuriantly in this, than in any other soil; but it is a very strong hardy plant and will grow anywhere, even in places where no other plant will grow. In some parts of the world, Java for instance, I am told that mulberry is always allotted to this description of soil. The quality of the mulberry leaf, however, on which the silk-worm is fed, has a very great effect on the produce in silk of the cocoons, and this quality is derived from the soil in which the mulberry is grown. I have found that the cocoons of worms fed on mulberry grown in a strong, dark, clayey soil, with very little, if any admixture of sand, will give better produce than the cocoons of those fed on mulberry grown in any other soil; the plant grown in this strong soil has more nutriment and of a better kind, than that grown in any other, and the color of the leaf is a darker green.

The soil all along the left bank of the Bhageratty river is light and sandy, that on the right bank is a strong soil; now the cocoons produced on the right bank are always better than those of the left, which arises entirely from the difference in soil and no other cause.

I may also here state, that I am of opinion, that mulberry, as at present cultivated by the natives, is well suited to the silk-worm in its first stages, but in the latter stages, the leaf of the standard tree might, I think, be given with advantage.

Ramnaghur, Coolbariah, via Merai, Nov. 9, 1839.

VII.—*On the different breeds of Cattle on the Western side of the Peninsula of India, and what has been done there for the improvement of Sheep and Wool:—with observations on the American plough. By J. LITTLE, Esq. late Secretary to the Bombay Agricultural Society.*

(Read at the Meeting, October 10th, 1838.)

The breeds of cattle met with in the districts of this presidency (Bombay), under the names of Deckanee, Khandesee, Concanee, Dessee, Ghattee, Kunnum, and Guzrattee, may be reduced to only two well defined species; viz. the Deckanee and Guzrattee; the others, there is every reason to conclude, arise from crosses of these two, or from the treatment of the animal whilst young. Little or no pains are taken by the natives to preserve the breed of either pure.

The former, a compact animal, averaging from $3\frac{1}{2}$ to 4 feet high, of various colors, is the common breed, and to be found in all parts of the country. The latter are very large, handsome animals; the prevailing color light grey or white, with black points; they are chiefly confined to the province from whence they take their name, and where they are in common use for all purposes. In other parts of the country they are seldom met with, except in the *garees* of the wealthy natives. These breeds are considered distinct from those of Malwa and Mysore; the superiority of the latter, however, may probably be attributed to the great care bestowed on the breeding and rearing.

The Deckanee, from its superior activity, capability of enduring fatigue, and subsisting on coarse food, is in greatest request for carrying loads, and for Agricultural purposes, unless where the draught is very heavy, or the soil soft and deep, as in the rice fields of the Concan, where the buffalo is very commonly used for ploughing, and occasionally also for drawing, and carrying water: the sluggishness of this animal prevents its being more employed in other sorts of

labour. The milk of the buffalo is superior both in quantity and quality to that of the cow.

Cattle are generally put to work at $3\frac{1}{2}$ or 4 years old, and will continue to labor 10 or 12 years, if well treated. They are fed upon grass, straw, oil-cake, bran, and the cheaper sorts of grain. The price varies from Rs. 30 to 120 a pair, according to the quality of the animals, season of the year, and part of the country.

Draught cattle for the public service are supplied by contract, and are generally purchased of Brunjarries from Malwa; a few only of the Deckanee breed are met with of sufficient *substance* for the artillery; for light guns they must be 12 to $12\frac{1}{2}$ hands, and for heavy iron guns $12\frac{1}{2}$ to $13\frac{1}{2}$ hands high. The Guzrattee breed, previous to 1837, were used in the artillery of the whole northern division of the army, but their use is now confined to the province of Kattywar; although of sufficient height and substance, they are deficient in the "blood," activity, and endurance, of the smaller breed.

A bullock load of stores or ammunition is 120 lbs., of grains 160 lbs.

The only wild cattle we have, is the Bison or Gyal, ("Gowha" of the natives) *Bos Gaurus* of Cuvier, which is indifferently figured and described in Vol. IV. Animal kingdom, London, 1827. It is found in the dense jungles, along the whole range of Western ghats from Asseerghur to Cape Comorin, sometimes of enormous size. A male was shot two years ago, at the convalescent station of Mahableshwer near the source of the Kistna, which measured at the shoulder fully 17 hands high. I am not aware that any have been domesticated in this part of the country.

To enable me to comply as fully as possible with your request, I lost no time in sending a set of queries to such of the members of our Society in different parts of the country as were likely to afford information, and I have now the pleasure to communicate a summary of the answers, together

with a copy of a communication (with valuable accompaniments) from A. N. Shaw, Esq. Civil Service, whilst at the Cape, to our Government, and also extracts of a letter from Colonel Hazlewood, Bangalore, to Capt. Jacob of the Bombay Artillery, shewing the advantages of crossing the common sheep of the country with the finer-woolled breeds of Europe.

Extract of a letter from Mr. Stokes, Madras Civil Service.

"The cattle spoken of as the 'Mysore breed,' are not, I imagine, the common black cattle of the ryots. These in the N. W. of Mysore, where my experience lies, are inferior to those of the Deccan, as regards their size, strength, and the quantity and quality of their milk. The cattle of E. and SE. of Mysore, or Madagery and Bangalore, are much superior to those of Nuggur. But these noted as the 'Mysore breed,' are the produce of a breeding establishment kept up by Government, and called the Amrit Mahal. An establishment of this kind existed from the time of Tippoo, I believe; and another was formed about twenty years ago, on a very liberal and improved scale, under the charge of a commissariat officer, by the Madras government. The Raja's Amrit has been broken up. The commissariat establishment is continued. The object of the latter is to supply bullocks for the gun-carriage department and commissariat. Some of the finest pastures in the territory are reserved for the breeding herds, and every means taken to ensure perfection in the produce. The bull calves get the whole of the cows' milk, and run at large with the herds, until three or four years old; after which they are inspected, and all the finest picked out and branded for the use of Government. The bullocks of this breed are more remarkable for activity and hardihood, than for size. They are short in the back and legs, and of a very compact make. As far as I have had an opportunity of observing, the common breed of the country has been benefited very little by the improvement which has

undoubtedly by those means been effected in the cattle required for public purposes.”

SHEEP.

Sheep are seldom reared in Guzrat, or the Concan, for want of permanent pasture lands. In Candeish and the Deckan there appears to be only one breed, with a coarse fleece, general color black, brown, or various shades of grey. Though small, they furnish mutton of excellent flavour.

Several experiments, to improve both fleece and carcase, are now in progress, the result so far promises to be satisfactory; but is not yet sufficiently advanced, to arrive at any certain conclusion. The Cape bred Merino Rams have been found to answer for this country better than those imported from England, so much so, that government have determined, henceforth to import only from the Cape, as appears by the following memorandum from Mr. Secretary Reid.

“The attention of Government was first directed at the latter end of 1835, to the improvement of the wool and sheep of Western India. From the information furnished to Government, it appears that many parts of the Deccan and Guzerat are very well adapted to sheep pastures, and that if the wool of this country, which, though of a very inferior kind, finds a ready market, were improved, by importing superior sheep so as to improve the fleece of the country breed, the people and the country would be greatly benefited.

“Measures were accordingly adopted by Government to import sheep of a superior breed; and in 1837 a supply of Rams and Ewes, about 105 in number, of the Southdown, Leicester, Cotswold and Merino breed were sent out, at a very heavy expense, by the Honorable Court, under the care of an experienced English shepherd. About 60 Rams and Ewes of the Saxon and Merino breed were obtained from the Cape of Good Hope, where the breed is understood to be very fine. A large supply of sheep (about 600) has also

been obtained through the agency of Colonel Pottinger and Captain Burns, from Afghanistan, Cabool, (whence the best wool imported into Bombay is brought,) and the pastoral districts in the vicinity of the Indus; a small number of sheep has likewise been commissioned from Bussora, as it is well known that the breed in that part of the country yields a very fine and lengthy fleece.

“The Sheep obtained from England, the Cape, and Cabool have been distributed throughout the country: many of them are entrusted to the care of gentlemen, who understand the management of this animal and take an interest in the undertaking. A sheep farm has been established at Ahmednugger, and another at the fort of Jooneer, where the climate is good, and pasturage plentiful; and these farms have been entrusted to Mr. J. Webb of the Civil Service, who has a good practical acquaintance with the management of sheep. The natives in the interior who breed sheep, are supplied from these farms with half bred lambs, and are allowed to send their Ewes to the Government farms to be kept with the Rams. Many of the Rams have been given to wealthy natives and Patells of villages (by whom they appear to be much prized,) who have flocks of their own, and who breed sheep for the sake of the wool, and not for the market.

“It appears that the Cape bred Merino sheep are far superior to those bred in England, and better adapted to this country. The English sheep are too large for the slight made Ewes of this country, and are moreover greatly affected by the changes in the climate. The Cape sheep are less affected by the climate, and not so subject to disease as those of this country, or of England, while their lambs are much stronger than those produced from the English sheep. It has therefore been resolved, not to obtain any more supplies from England.

“As the farms have been established so short a time, it is scarcely possible that any great improvement can have been effected, or that the result of the experiment would have be-

come very manifest. A quantity of wool, the produce of the sheep of the cross breed, has been lately submitted to the Chamber of Commerce; and there is every reason to hope that the measures pursued by Government to improve the sheep and wool of Western India, will be attended with the most marked success, and ultimately with the most beneficial consequences to the country."

PLOUGHS.

The superiority of the English or American plough over the common plough of the country, is universally admitted by the ryots; but the high price of the former, the difficulty in renewing or repairing the iron work, together with the greater number of bullocks required to work it, are likely to form insuperable obstacles to its ever being generally adopted by a poor and bigoted peasantry, by whom *time* and labor are so little valued. The following extracts from letters on this subject shew what has been done, and what may be expected.

From Doctor Gibson—Jooneer.

"I have used both the American and the Scotch plough, but they have not otherwise been introduced here. The natives seem generally of opinion, that their own plough is superior to the American; as they say, the latter does not go deep enough, and is too flat in the floor. The vast superiority of the Scotch plough they with one accord admit, but then the draft is heavy, and requires double the number of bullocks, which their own requires; besides, they have not the means of repairing screws or other iron work of foreign ploughs, when deranged."

From A. Elphinstone, Esq.—Rutnageery.

"In the month of June last, I brought an American plough here, which I found useful; it casts the ridge on one side, and forms the furrow on the other, which in growing sugar-cane here, would save the manual labor of making

trenches with the hoe, to carry off the water. The native plough makes no furrow, but divides the ground equally. The Concanee plough is a very light affair, drawn by two bullocks, but is only adapted for the shallow soils of the hill sides, or the mud of the rice beds, as it cannot penetrate beyond four or five inches. The American plough can be drawn by two buffaloes, and penetrates much deeper; the large Deccan plough penetrates deepest, but is so heavy as to require four buffaloes or six bullocks, and is not used in the Concan. The American plough could not be made here for less than nine rupees and a half; the Concanee plough costs from half to three quarters of a rupee, and would not, I think, be so liable to break among stones. The American plough would only be preferable where the soil was deep, and free from stones."

From Doctor Elliott—Dhooliá.

"A few American ploughs have been introduced by Government, the result of which has not been fairly seen, but in addition to the considerable expense in the purchase, as compared with the country plough, and the number of bullocks required to work the former, the soil of Khandeish is generally so loose, as hardly to require a plough to turn up the ground to any depth; indeed the Natives in many places only have recourse to the plough every other year, using merely the harrow in alternate years."

From Sir R. K. Arbuthnot—Nassic.

"With respect to the American plough, I fear I cannot send you a very encouraging report of their introduction, which however appeared at first to promise better things. I made trial of them in the cultivation of some land, which had been waste for many years, with Mauritius sugar-cane, on account of Government; and nothing could be more successful than the first attempt, both as regarded the effects of the ploughs on the land, and the impression which it made on the minds of the Natives, who came daily in crowds

to witness the operation, with which they unanimously expressed their satisfaction ; but still, so inveterate are they in their adherence to their old customs, and their dislike of the trouble of trying anything new, that I believe their introduction will be very slow. If the plough were given to them for nothing, they might, after their old plough is worn out, be induced to try it, rather than buy another, which would cost them about two rupees ; but hardly under any other circumstances. I had a few made up, which I induced some of the more wealthy of the ryots to purchase, at a price, much below their cost, I believe ; in the hope they would give them a trial, and that others, on seeing the advantage of them, might be induced to come forward, and make a demand for them ; but, to my mortification, the other day on visiting the place, and making enquiries on the subject, I found they had not been used to plough a single furrow. In the present state of Agriculture, which yields so trifling a profit to the farmer, a high price would be a complete bar to their introduction, except in cases where individuals possessed a good deal of sugar-cane land, and had considerable means at their command, when their great advantage in deep ploughing might be an inducement to them to get one. One great objection which is always urged is, that they require six bullocks to drag them effectually, which few ryots can afford. A skilful ploughman, I have no doubt, could make them answer with four, or even two large bullocks, but in the hands of an unpractised person, the share is apt to run deep into the land, which it requires great force afterwards to move. The manner in which the land is turned over by them, in comparison with their own ploughs, by which they allowed, that a saving of time and labor is effected in the proportion of 1 to 3, attracted their attention almost immediately ; but time and labor is at present of little value to them, and the introduction of any improvement, which will merely save these, is not appreciated. Time however, and a feeling which they are I think begin-

ning to have, that beyond their tax, Government has no wish to take from them what they become possessed of through their own exertions, will, I have no doubt, work a change on their habits, and probably in a shorter space than we imagine. The peculiar tenure on which land is held in the Deccan, is a great bar to improvement, I mean, where the old proprietor has relinquished his estate, and it has got into the hands of a new-comer."

From Lieut. Geo. Wingate—Indapore, Poona Collectorate.

"The introduction of the American plough has been attempted in these districts, but with very little success. Its superiority over the country plough, especially for garden cultivation, is admitted by the most intelligent coonbies, who have witnessed its performance, but I have been unable to overcome their objections to its expense, (which appear indeed almost insuperable,) and their apprehensions of its breaking, in case of any severe jar, such as coming in contact with a stone; their fears on this head, I regret to say, are not without foundation, two of the ploughs brought from Madras having broken, when exposed to a fair strain. This, I should say, is the consequence of defective casting; several instances of which I have myself observed in these ploughs."

Papers connected with the production of Wool for exportation.

To the Secretary of Government, &c. &c. &c.

Bombay.

SIR,

I venture to lay before the Right Honorable the Governor in Council the accompanying papers connected with the production of Wool for exportation. My attention was at first attracted to this subject from curiosity, and a want of employment leading me to visit several of the large sheep farms; and thus the practicability of introducing Merino sheep into India presenting itself, has become confirmed;

so much so, that the Government permitting, I will enter into a speculation either wholly conducted by myself, or in partnership with some person or persons more conversant in the treatment and management of sheep.

It is probable there may be objections to a public servant entering into private speculations; it is possible also that all information on this subject may be well understood by Government: I plead therefore in excuse for intruding upon the important occupations of the Right Honorable the Governor in Council, my conviction of the success of the speculation and my desire, as an individual, to embark in a scheme that seems to me so decidedly profitable, and, if as a public servant, I stand precluded, the sincere inclination of rendering a service, however humble, to the country, in which I have passed so many years.

My own knowledge is very limited, but, drawing an analogy between the climate of my late districts, the sub-Collectorate of Bagulcota, and this colony, I have no hesitation in saying that the former for rearing sheep has the advantage, in as much as the rain and damp are considerably less than that I have seen in this colony. Many parts of the Bagulcota* districts are much better supplied with water, the heat and cold also are more temperate, and the pasturage equally as well adapted, with labor and carriage at one-tenth part of the expense of this colony.

Without expatiating further on this subject, I beg to remark, that the paper marked No. 1, is an extract from the South African Directory for 1834. Paper No. 2, contains questions which I submitted to several sheep breeders. No. 3, the answers of Mr. Lawrence Cloete, one of the most extensive farmers in the colony. No. 4, an extract from the Directory.

I have the honor to be, &c.

(Signed) A. N. SHAW, B. C. S.

Stellenbosch, 1st Dec. 1836.

* S. Mahratta country.

On the growth of Wool.

In our last South African Directory for 1834, we urged the agriculturists to make increased exertions to promote the growth of wool by the purification of the present breed of sheep in some places, and by the introduction of Merino and other fleecy sheep in other parts of the colony fit for grazing. The necessity of the measure being established we proceed to demonstrate its value, by an exhibition of the rapid strides made in European countries, and especially by the neighbouring colonies of New South Wales and Van Dieman's Land, where in the course of about 10 or 12 years, the wool exported increased from 50,000 lbs., to 2,000,000 lbs., annually, or 40 times the quantity! and, in the past year, an increase of about 800,000 lbs., over that of the preceding year, has taken place in those countries.

Treatises are out of place in a work of this kind. Facts are more valuable than assertions; figures speak more conclusively than words. We shall therefore now briefly show from the latest returns, the progress made by the wool-growers in Germany, and our fellow-colonists and countrymen in Australia, in the production of wool for exportation to Great Britain, and leave the reader to draw his own inferences, the astonishing success of other countries, and the great augmentation of the quantity of wool in a few years, will be the most effectual way of exciting emulation among the Cape farmers.

Spanish Merinos were first introduced into Germany by the king of Saxony, in the early part of the present century, and now nearly the whole of that flourishing branch of agriculture is transferred from Spain to Germany. Since the peace in 1814, the demand for Saxon wool has caused an increase of nearly nine times the quantity. In 1814, there were imported into England from Germany, 3,600,000 lbs.

In 1819, 4,500,000 do.

In 1824, 15,400,000 do.

In 1828, 23,000,000 do.

In 1830, 26,200,000 do.

the value of which in round numbers, may be safely estimated at £1,800,000. The total quantity of wool produced last year in Germany has been valued at £5,500,000, or upwards of Seventy Millions of Rix Dollars.

The origin of the growth of wool in Australia is well known; it may however, be repeated, as an incentive to perseverance. A few sheep of the Merino breed were taken to New South Wales from the Cape of Good Hope in the year 1795, by the captain of a merchant vessel. Part of this small flock fell into the hands of Captain M. Arthur, the com-

122 INCREASED EXPORT OF WOOL FROM AUSTRALIA.

nections of whose family now rank among the most wealthy and respectable inhabitants of that country, who, with additions from Europe, reared a large flock. In 1806 the first shipment of Australian wool was sent to England on trial. The result encouraged further exertions, and, after a few years spent in the necessary arrangements, regular exportation began and has continued to increase prodigiously up to the present time. With increase in quantity, quality has not been neglected; and some wool lately sent from Sidney brought a higher price, and was preferred to even the finest Saxon wool, a test at once of its excellence, and of the remuneration which awaits industry and perseverance. The increase, it will be seen, has been progressive. From 1814 to 1820, from 60,000 to 70,000 lbs. were annually exported.

In 1821,.....	175,400 lbs.
, 1822,.....	138,400 „
„ 1823,.....	477,200 „
„ 1824,.....	382,900 „
„ 1825,.....	324,000 „
„ 1826,.....	1,106,300 „
„ 1827,.....	1,512,700 „
„ 1828,.....	1,600,000 „
„ 1830,.....	2,000,000 „
„ 1831, 32, (each)	2,200,000 „
„ 1833, (about)	3,000,000 „

In Van Dieman's Land, also, the settlers, actuated by a feeling of rivalry, are directing their chief attention to the growth of wheat and wool to the exclusion of cattle grazing and other minor branches of husbandry.

The spirit of rivalry is now, too, we are gratified at being able to state, fairly in motion all over this settlement. The sheep farms of Messrs. Breda, Reitz and Co. near Swellendam, of Lieut. Daniell and Mr. F. Whitc, in Albany, besides numerous others in various districts, are evidence of the fact, while the attention lately shown by several farmers, and the inquiries made for Merino rams, prove, that the profitable nature of the occupation is becoming at length fully known: altogether we have sufficient reason for hazarding the assertion, that in a few years the fleece will form the second or third article of our staple exports, and that in two or three years its value will not be far short of one million of Rix dollars.

To the demand for wool there is almost no limit. It is also a staple commodity, unlike wine, and other articles of luxury, it is liable to no fluctuations from change of fashion, taste or caprice; in the rearing of sheep there is no waste, all that is grown is profitable: there are the wool and the skin for exportation, and the flesh for home consumption.

This colony is supereminently adapted for the grazing of sheep; it is extensive, genial, salubrious, and the bastard Hottentot is an excellent shepherd. Obstacles exist here, doubtless as in other countries, but they are fewer than in Europe, with all the appliances of science at hand. The European sheep farmer has difficulties to encounter which he surmounts by indomitable vigilance and skill alone: frost and snow, intense cold, and heavy rains, &c, these bring on sickness, and the death of countless numbers of sheep. The Cape sheep farmer, (except in the North-western parts) escapes these evils, and the consequent expense of building covered sheds to protect the sheep from inclement weather."

The following "Hints" are given on account of their practical value.

Purity of blood is the great essential towards producing wool of such uniform fineness of texture as shall befit it to compete with the German and Australian fleeces: it is therefore of vital consequence to the farmer to obtain Rams of pure Saxon breed, or at least of recent Saxon origin: defect also in breeding and a want of care in the shearing of the sheep at regular periods, may destroy the value of the wool though the blood be pure, the utmost attention therefore must be paid to these points. The following directions for the management of wool were drawn up by a wool-broker of much experience in London, Mr. W. Buchanan for the use of growers in New South Wales: they are equally applicable in this colony.

Washing.—It is of great importance that the fleece should be well washed, that the wool may be brought to market with as bright a colour as possible; every convenience and a plentiful supply of pure water should therefore be provided, a running stream being most desirable.

The preferable mode of washing is that which is performed before shearing, according to the German manner; some growers have tried the plan of washing after the fleeces have been shorn and sorted, and, as is supposed, have used tepid water, following the French and Spanish method; but this has not been approved of by the buyers generally, and particularly by those who buy for combing purposes.

The breaking of the fleece, and washing after shearing, gives the wool more the appearance of Spanish, than of German wool, and consequently reduces it to a lower standard of comparison. It is well known that the sheep of those German flocks that are best washed, are, after that operation, driven into some shed strewed with clean litter; or penned up with hurdles on clean grass; that the utmost care is taken to prevent their exposure to dirt or whatever else might tend to sully their whiteness, and that they are not shorn until a sufficient degree of moisture is deposited in the fleece by perspiration, to impart a soft handle to the wool. It may be here added, that it is very important, if possible, to prevent the sheep from filling their fleece with grass seeds, broken leaves, and other extraneous substances which cannot be removed in the operation of washing and which are productive of labour and expense in every process of manufacturing, in some cases indeed rendering the wool almost unsaleable; it may be here observed, that so conscious are the Spaniards of the superiority of the German mode of washing and assorting, that they are making every effort to introduce it, assorting and accommodating, in order to assimilate the Australian wool as much as possible with the German. In preparing it for market, the fleeces should not be broken, but merely divested of the breech and stained locks, and so assorted or arranged that each package may contain fleeces of the same character as to color, and then again as to length, fineness, &c.

If the washing has been formed at the same time and place, and with an equal degree of care, the color is likely to be uniform, and it will then only be necessary to attend to the separation of the fleeces as to length, fineness, and general quality, but if a large grower has flocks of different breeds, and fed on different soils, care should be taken that the fleeces be separated first as to color, and then again as to the length, fineness, &c.

Packing.—The fleeces being assorted, as already suggested, should be spread one upon another, the neck of the second

fleece being laid upon the tail of the first, and so on alternately to the extent of eight or ten fleeces, according to their size and weight. When so spread the two sides should be folded towards the middle, then rolled together, beginning at each end and meeting in the centre, and the roll of bundle so formed held together by a slight packthread.

The bagging should be of a close, firm, and tough nature. The material hitherto most used has been sail-canvas, which very ill resists bad weather on a long voyage, and when received here, even in a favorable condition, is so dry and crisp that it will tear like paper. A thicker twilled, more flexible and tough material would be preferable, the size and form of the package may be in length about nine feet, and width four feet, sewed up on the two long sides, and at one end, the other end being left open, and the sheet so formed being suspended with the open end upwards to receive the bundles made as before directed, which are to be put in one at a time, one of the flat sides of the roll or bundle being put downwards, and so on in succession, being well trod down, until sufficiently full for the mouth to be closed. This is the German mode of packing, but it is doubtful whether smaller packages of the dimensions that have been hitherto sent from the two colonies may not be more convenient for so long a voyage.

The screwing of the bales should be discontinued, where it has been practised; as the pressure by the screw, and remaining compressed during the voyage, occasions the wool to be caked and matted together in a manner that is highly prejudicial to its appearance on arrival. The practice also of winding up each fleece separately, and twisting a portion into a band, is productive in a minor degree of the same prejudicial effect, and it is to avoid this that the making German bundles, of eight or ten fleeces, is suggested*.

* V. D. Land is about as large as the Swillidain District : it contains about 10,000 miles: in 1831, it exported wool valued at nearly £50,000, upwards of Rix dollars 650,000.

Queries and Answers.

1. The price of 100 Merino Sheep of the Cape breed ?
The price of 100 good young Ewes will be £2 per head.

2. The price of six Rams of the above breed ?

Colonial breed through Merinos, or Saxons, can be had at from 2 to £5 per head.

3. What would be the expense of importing 20 Ewes and 4 Rams from Europe ?

This can be more accurately ascertained from the accounts of our Agricultural Society, in Cape Town.

4. What would be the annual expense of maintaining 100 Ewes and 6 Rams ?

At a very trifling expense, in a Cape farm adapted for grazing, as so small a quantity would not be considered as forming any part of the stock on the farm, and would not be at all prejudicial to the other stock on it, nor to the cultivation of it : in many cases they would be a benefit to it.

5. What would be the nature of the attendance they would require ?

I should recommend one good shepherd, European by all means, if to be had.

6. What average quantity of wool would they yield ?

In my opinion, on an average, not more than 2 lbs. each.

7. What average number of lambs might be expected during the first year, and at the end of five years what would be the probable amount of the flock ?

About 80 would be reared. The flock at the expiration of five years will be, (unless some particular fatality happen, or great negligence has taken place) about 540, consisting of

Ewes,	180
Ewe lambs,	70
Wether ditto,	70
Yr. Ewes,	60
Yr. wethers,	70
Wethers,	110

8. Is the Merino sheep a hardier animal than the common Cape sheep ?

Decidedly.

9. Does the dry, wet, hot or cold weather agree best with Merino sheep ?

Merino sheep do best in dry hot weather.

10. Would the Merino sheep be likely to be a productive speculation in a dry climate, with a range of thermometer from 70° to 85° through the year ?

I think so, if the pasturage be adapted for sheep.

11. Would a climate considerably warmer than the above, and with five months of great damp be prejudicial ?

I have invariably observed that my flocks never thrive during the continuance of damp weather, and also that most of the diseases incidental to sheep in this colony, make their appearance during damp weather, and immediately after, therefore I am of opinion that great damp would be decidedly prejudicial to sheep.

12. Say that the sheep farm is 100 miles from Cape Town, that the flock consists of 500 sheep, at what price must wool be in Cape Town, to remunerate the farmer for the past years ? I will consider that this is the fifth year of the sheep establishment, and that the farmer has in the four previous years paid the expense of the original sheep expenses, &c. &c. attending them. So that the surplus in the fifth year is profit : would this be so ?

I think that wool can be grown with profit on a good sheep farm at 1s. 6d. per lb. with ordinary management ; also that the surplus in the fifth year would certainly be profit. I think even the fourth year would be so, if the flock had been well looked after in a good farm.

13. At the end of five years to have 500 sheep yielding wool, what number of sheep would be required to commence with ?

100 Ewes of 2 and 3 years old would, in five years, give a flock of upwards of 500.

14. What are the diseases incidental to sheep?

Scab, which, in damp seasons, is very destructive; consumption for which no remedy as yet has been discovered; the FOOT rot caused by sheep being kept in wet kraals and is contagious; blindness, giddiness and a diarrhoea that young sheep and lambs particularly are subject to, occasioned generally in Autumn by the sudden springing up of a rich pasturage, by heavy rains after a dry summer.

15. Any remarks or information having reference to sheep, or connected with entering into, or introducing Merino sheep into India?

To this, I can venture no opinion, excepting that full grown sheep thrive better on board ship than young ones; but from what I have *heard* of India, I should say that there were many places well suited for Merino sheep.

Profit and Loss Account of a Sheep Farm in Albany.

	Dr.				Cr.		
	£.	s.	d.		£.	s.	d.
To expenses of Shepherds and other items, for one year,	120	0	0	By 52 Rams at 15 per head, ..	39	0	0
Washing and Shearing 5,000 sheep at 4d.,	83	6	0	100 ditto at 1l. 10s. ditto, ..	150	0	0
Carrage to market,	10	0	0	530 Crossed Ewes at 50 ditto, ..	132	10	0
Clear profit in one year,....	837	13	4	20 Fat wethers at 4s. 6d. do.	4	10	0
				8,12,000 lbs. wool at 1s. 2½d.			
				per lb.	725	0	0
					£1,051	0	0
	£ 1,051	0	0				

Extract of a letter from Colonel Haslewood to Capt. Jacob, Bombay Artillery, dated Bangalore, April, 1837.

“I am happy to see that your Government have taken up my plan for improving the Indian wool. I have just received six more Saxon rams from the Raily flock at Sidney; the price there is ten, seven, and five guineas each according to the cross, or rather according to the size. Mr. Sullivan brought out two Merino rams and two ewes, and I have seen the effect of crossing by these, and also by South-down rams imported by Sir William Rumbold on the Neelgherries. Even the red hairy sheep of India, become South-down in size, and wool, in the second generation, and the

white woolly sheep of India become Merino, and Southdown in size and wool, after one crossing. I have shorn Mr. Sullivan's Merinos that have been two years in India. After twice washing and shearing, the day after the ewes gave five and four and a half pounds each. In fineness, length of staple, elasticity, and *oiliness* equal to any I ever saw in Tasmania, where two and a half pounds is the utmost ever got from a ewe of the Merino kind, which seldom weigh more than fifty pounds per carcass when killed; and these ewes of Mr. Sullivan's had been shorn only seven months before.

"My flock I have removed here (Bangalore) from the Hills*, as the rank grass there does not answer for sheep brought from below, although those bred there thrive exceedingly well. I am completing my flock here to 700 white woolly ewes, for which I have rams enough, pure Saxon. The rutting season begins here in June, and the lambing from November to January, and they may be shorn in February and in September. I do not know if you have any white woolly ewes indigenous to your provinces, although I know you have the black woolly; but you may get the white ones between Jalna and Beder, where I hear there are many flocks. We only have them in Coimbatore, and the Barramahal. After my flocks have given their first lambs, I shall turn it over to the Mysore Commissioner, and return to Tasmania."

VIII.—*On the great facilities of Amherst Province for the production of Sugar.* By EDWARD RILEY, Esq.

[Read at the Meeting of the Society, Sept. 1839.]

Before entering into particulars regarding the musters of Sugar accompanying this, a few remarks on the nature of the Sugar-cane grown in this Province, the mode of cultivation adopted by the natives, its qualities, &c. compared

* Neelgherries.

with the Otaheite description, will not be inappropriate ; it will further tend to shew the facility with which it might be grown to a large extent ; and the improvement, and consequent more successful result, which would attend an extensive cultivation by using proper measures.

The descriptions cultivated in this Province are the ratan and red canes, the former being in more general use, on account of its extreme hardness ; the latter however is superior in quality, and generally attains the height of about five feet on an average with a diameter of $1\frac{1}{2}$ inches.

A site having been fixed upon for the purpose of planting the cane (always elevated above the level of the plains which are liable to inundation during the S. W. monsoon) the cultivator commences cutting down the jungle about two months previous to the rains, which is then burnt and allowed to remain until the first showers of the monsoon have penetrated the soil, rendering the previously hard surface soft and friable, and without any further process the stoles are planted perpendicularly in rows at the usual distance apart, covered over with the burnt soil, and allowed to vegetate without any other attention being paid them. A plough is an article almost unknown to the cultivators, and in no instance ever applied to this species of cultivation ; the only method they have of preventing noxious weeds from springing up is by planting cucumbers, chillies, pumpkins, &c. between each row, which, coupled with the property the burnt soil possesses in this respect, completely effects the object. Notwithstanding the heavy fall of rain during the season (about 200 inches) the cane with only this attention paid it, thrives progressively during the monsoon, and is at full maturity in nine months from date of planting. The only labour attending a plantation of the above description besides that of clearing and planting, is enclosing, which is done with the partially burnt stumps found on the ground.

The cultivator having prepared a mill composed of two vertical wooden cylinders, supported by a frame and worked

with a buffalo, the cane is manufactured on the spot. The juice undergoes no process of clarification, except that of removing the scum from the surface during the ebullition, and being sufficiently inspissated, it is thrown into a shallow frame where from exposure to the air, with scarcely any of its feculencies extracted, it forms a heavy hard mass ; it is then cut into small squares and conveyed to the bazars for sale, where it is disposed of at about 20 rupees per 100 viss, of 365 lbs.

The following statement is procured from a cultivator, who, not taking into account the value of his labour, or that of his family, assured me that he had made 400 rupees by his cultivation of one season ; it will be seen, however, that his remuneration, taking every thing into account, and allowing twelve months for the completion of his undertaking, affords a much greater inducement to the natives to become cultivators than working as hired coolies, even at the high rates current here (half a rupee per day), more especially as the Burmese cannot be convinced that they should take their own labour into account in their cultivation, and as the gross amount of returns appears to them the real profit. I am decidedly of opinion that a very large extent of this province would be soon brought into cultivation were the inhabitants more abundant ; as it is, a number of persons who have become aware of the advantages derived from it, have commenced clearing jungle to a considerable extent, and as they pay nothing for the ground, and the outlay required is only the trifling one for the plants, a yearly increase must necessarily ensue, an emulation will be created and improvements upon their present slovenly method of cultivating will obtain footing, which, aided by the powerful stimulant of European enterprise and skill, will eventually give a name to these provinces hitherto not possessed.

The following is the calculation above alluded to.

1 man with a family of a wife and 2 children able to work can clear ground and plant 10,000 plants which cost, Rs. 14

If the man and his family were to employ their labour as hired coolies they could procure,

The man	10 Rs.	per mo.	12 mos.	Rs. 120
The wife	5 do.	do.	do.	60
The children	4 do.	do.	do.	96

— 276

The crop stands him at maturity, 290

The average of each stole at the lowest is 4 canes

10,000 stoles, 40,000 canes, which produce of coarse sugar 60 viss per m. 2400 viss sells in

Maulmain, 20 Rs. per 100 viss, 480

Leaving a profit to the cultivator more than he could procure as hard laborer for 12 months,.... 170

N. B. It must be observed that very few Burmese will work even six months consecutively; hence the rate of 10 Rs. per month which I have stated as the man's wages for 12 months.

With the apathy peculiar to their character, the Burmese look no farther than present advantage dictates; the only labour required to produce a fair crop of ratoons, would be merely banking the plants during the rains and trashing them properly, neither of which is done; the consequence is, that the old stems being left to themselves during the dry season, are either killed by the heat or choaked by the parched surface through which the fresh shoots must penetrate, and such straggling canes as make their appearance, and come to maturity are little better than ratans in appearance.

Muster, No. 1 of 320 lbs. 1st Quality Sugar—obtained from 10,000 canes of native cultivation. These canes at the time of cutting were not sufficiently mature, but being the only lot procurable and wishing to complete the experiment before the commencement of the rains, it was deemed advisable to use them in that state as it would in some measure shew what could be done in the article by purchas-

ing from the cultivators under every disadvantage ; added to which, the loss of juice by the inefficiency of the native mill, nearly $\frac{1}{3}$ rd, it may be stated, with little chance of being far out, that a loss of $\frac{1}{3}$ rd has been incurred in the gross amount of produce upon that which would have been obtained under the most favorable circumstances. The quality has been pronounced by competent judges to be equal to any manufactured in India.

Muster, No. 2 of 360 lbs. 2nd Quality—produce of the said 10,000 canes.

Muster, No. 3 of 85 lbs. 3rd Quality—ditto, ditto.

The above underwent the process of claying twice during 20 days from the date of manufacturing :—the following is the total amount of produce from the above quantity of canes.

1st. Quality	320 lbs.	worth 65 Rs. pr. 100 viss of 365 lbs.
2nd ditto,	360 lbs.	50
3rd ditto,	85 lbs.	35
Molasses	420 lbs.	20

Muster, No. 4—is sample of sugar made as an experiment from 100 canes of the Otaheite description which produced 10 lbs. of sugar, 1st and 2nd quality being mixed, 30 days claying.

These canes were produced from ratoon tops planted at the commencement of last rains (May 1838) and were cut on the 1st March 1839, at which time they were, on an average, six feet long by three inches in circumference ; this description of cane comes in full maturity within nine months from the time of planting, which has been proved by several succeeding crops from the quantity of which the above 100 canes formed part, and if allowed to remain much longer than this period (as was the case with the canes forming the present experiment) they become rank and lose a portion of the saccharine quality. The produce of juice was about 18 gallons, whereas that of the native cane does not exceed 8 gallons per 100 canes : the proportion of sugar produced is however in favor of the latter.

The Otaheite cane is not cultivated to any extent in this province, in fact the only canes grown are at this place in number about 2000, the produce of a few cuttings procured from Calcutta some time ago as an experiment: their extreme luxuriance planted in a prepared soil on a harsh understrata of clay-ironstone leads me to suppose that their rankness and want of saccharine quality would be obviated by planting upon common jungle lands, without manure or any other preparation than that of clearing, ploughing, &c., the rich quality of our lands here being amply sufficient to bring it to maturity.

Amherst, May. 1st, 1839.

Report by a Calcutta House on the four musters of Sugar.

No. 1. Good colour and fine strong grain, suitable for any market: value 11-4 Co.'s Rs. per Bazar maund.

2. Middling quality, not desirable for this market, but would sell readily in London: worth here 6-8 to 6-12.

4. A shade better: worth fully 7 Rs.

3. Very coarse brown sugar, worth 5-4 or 5-8: would meet with a ready sale here in any quantity for the London market.

IX.—*Remarks on an East Indian Turnip-fly (Haltica-nigro-fusca).* By J. T. PEARSON, Asst. Surgeon.

Desc.	CL.	Insecta.— <i>Auctorum.</i>
	ORD.	Coleoptera.— <i>Auct.</i>
	SEC.	Tetramera.— <i>Latreille.</i>
	FAM.	Chrysomelidæ.— <i>Leach.</i>
	GEN.	Haltica.— <i>Auct.</i>
	Sp.	II. Nigro-fusca.— <i>Mihi.</i>

Black Haltica, with brown legs and antennæ.

Colour, shining black, with a shade of blue. *Form* oval. *Head* and *thorax*, thickly and minutely punctated. *Elytra* minutely punctated in lines; but appearing, as well as the *head* and *thorax* smooth to the naked eye. *Antennæ*, *tibiæ*

and *tarsi* brown; the *antennæ* hirsute; *tibiæ* and *tarsi* clothed with short stiff hairs. *Thighs* black; minutely punctated; clothed with coarse distinct hairs. *Under surface*, black, slightly iridescent.

Sexes alike.

Length 0.10 inches; breadth of elytra 0.05 inches.

Inhabits Darjeeling in the Himalayah mountains. Found in gardens, on the young plants of the cabbage, cauliflower, turnip, radish, and others of that order.

Obs. This destructive little insect differs from any species of the genus *Haltica*, of which I have met with a description. Its ravages are but little, if any, inferior to those of the celebrated "Turnip-fly," or flies, the *Haltica nemorum* and *concinna* of entomological authors; complete rows of the young plants being sometimes destroyed by it soon after they appear from the ground: its attacks are particularly destructive to the two first, or seed leaves; but it preys also upon the succeeding ones, though not to the same extent, eating a few holes in them only, and not destroying the plant.

Mr. C. D. Russell informs me that last year (*and never before*) this, or a similar insect, committed great ravages on the Indigo throughout the whole district of Rungpoor; first attacking the young plant; and after the rains, the crops for seed. He has promised to try to furnish me with the specimens; and should he be able to do so, I shall have the pleasure of laying a description of the insect, together with such information as I may collect, before the Society. Perhaps other gentlemen in the district will favour me with communications on the subject.

Among the expedients to get rid of the plague of "*the fly*" the chief have been dressing the land with lime, with wood ashes, and even with sulphur; but all without the least success. Mr. Le Keux, in an excellent paper in the transactions of the Entomological Society, says, that in one instance he tried watering the ground on the fourth day after sowing it with turnips, with a mixture of one ounce

of tar, one ounce of olive oil, and two ounces of strong caustic potash, shaken up with a quantity of water (how much is not very clear) with apparent success. Carbonate of Ammonia succeeded in killing the insect, but it destroyed the plant also. Steeping the seed, as is done against the vegetable parasitical destroyer, "*the smut*" in corn, would probably do no good here; but it might be tried. In short, of all the expedients hitherto resorted to, none have succeeded in keeping off "*the fly*," unless we may except the above quoted single experiment.

Perhaps a remedy may be found in pitting one insect against another, the insectivorous against the herbivorous tribes; and by encouraging, rather than scaring away, the insectivorous birds. In this way the larvæ of the lady-bird (*Coccinella*) devour the "*Hop-fly*" (a species of *Aphis*, and not a beetle) and save the plant: the parasitic larvæ of the *Hymenoptera* attack the insects they feed upon in all its states; and those of the *Diptera* the *hymenopterous herbivora*. Of this last Mr. Yarrell gives an account in the *Trans. Zool. Soc.* in his paper on the "*Yellow fly*," (*Athalia centifolia*) where a *Dipterous* parasite is described as inhabiting, and having devoured the larva of that destructive insect.

Mr. Le Keux is of opinion that the antidote against these insects will be found "in some effluvia, or odour, which may be either offensive to the insect when near, or so overpower the scent of the turnip as to prevent the fly from distinguishing, and being attracted by it." He further remarks that, so long as the plants are kept wet the insect disappears; which agrees with my own observations on the Darjeeling insect.

The attacks of the "*Turnip-fly*" are said to be diverted from a plant by more attractive food. Thus Mr. Le Keux has "*invariably*" found that the *white stone turnip*, mixed with the *Sweedish turnip*, protects the latter; the insects preferring the former, so that the *Sweedish* has time to grow up beyond their power of destroying it, while they are en-

gaged in devouring the other sort. This appears to be the easiest of all methods of defending a crop whenever it can be done; and well worth making experiments upon. Should there be found a plant which the Rungpore insect prefers to the more precious Indigo; the advantage of employing this expedient need not be dwelt upon.

As the subject of insects hurtful to Agricultural productions is at present exciting much interest in Europe, I have thought it well to present the foregoing observations to the Society: for, it is of the greatest consequence that attention should be every where awakened to it, in the hope of discovering some remedy against their ravages. It cannot be thought a trifling matter, when it is considered, that an irruption of "*the fly*," will be as fatal to the prosperity of the planter as an inundation of the Ganges.

PROCEEDINGS
OF THE
AGRICULTURAL AND HORTICULTURAL
SOCIETY OF INDIA.

JANUARY 9, 1839.

Agricultural Society of India.

The Anniversary Meeting of this Society was held at the Town Hall.

Present.

Mr. C. K. Robison, Vice President, in the Chair.

Messrs. W. Cracroft, W. Storm, N. Alexander, W. F. Gibbon, T. Brae and A. Grant, Capt. W. N. Forbes, Col. D. McLeod, Lieut. Abercrombie, the Rev. T. Boaz, Drs. O'Shaughnessy and H. H. Goodeve; Messrs. A. Beattie, W. Mackenzie, M. Staunton, W. Earle and H. M. Parker, Drs. B. Burt, Egerton and Corbyn, Nawaub Tohowerjung, Messrs. James Colquhoun, D. E. Shuttleworth, N. Hudson, R. S. Strickland and T. Bracken, Dr. Spry, Majors Carter and R. Becher, Messrs. C. R. Prinsep, N. B. E. Baillie, Thomas Palmer, P. Sutherland, D. W. H. Speed and T. H. Gardiner, Dr. James Hutchinson, Messrs. Colin Campbell, C. M. Hunter, W. Byrne, C. Huffnagle, F. L. Beaufort, D. Hare, John Allan, W. Patrick, Joseph Willis, G. T. F. Speed, C. Trebeck, J. W. Masters, W. C. Hurry, H. C. Kemp and D. C. Low, Baboo Dwarkanauth Tagore, Messrs. T. S. Kelsall, W. W. Kettlewell, A. H. Sim, E. Preston, A. Holmes, T. Dickens, E. S. Hodges, T. Leach, A. Porteous, W. G. Rose and G. U. Adam, Drs. D. Stewart and Wallich.

The proceedings of the last Meeting were read.

MEMBERS ELECTED.

The following gentlemen, proposed at the last Meeting, were elected members of the Society; viz.

Messrs. J. Gilmore French, G. Buckland, J. Marquis, Joshua Athanass, Gilson Rowe, and Charles Dubordieux.

MEMBERS PROPOSED.

The following gentlemen were proposed as members:

T. P. B. Biscoe, Esq., C. S., proposed by Dr. Strong, and seconded by Dr. Wallich.

Charles Scott, Esq., 27th N. I., proposed by Captain F. Jenkins, and seconded by Dr. Wallich.

James Wood, Esq., proposed by Mr. Thomas Brae, and seconded by Mr. C. M. Hunter.

Dr. R. H. Bain, proposed by Dr. H. H. Goodeve, and seconded by Dr. O'Shaughnessy.

R. Wooldridge, Esq., (Muddumtollah Factory, Jessore,) proposed by Mr. E. S. Hodges, and seconded by Mr. A. Porteous.

The Vice President stated, that this being the anniversary meeting of the Society, the subject that would first claim the attention of members, was the election of office-bearers for the present year, and as a preliminary measure, he begged to bring to their notice, the several applications which had been received for the office of Secretary, vacant by the demise of Mr. Bell, viz., from Mr. H. Piddington, Dr. Spry, Messrs. J. W. Masters, D. W. Speed, and T. F. Speed.

Mr. Roblson further stated, in connexion with this subject, that he would at this stage of the proceedings, read to the meeting, a proposition from the President, which he had been requested to bring forward,—Sir E. Ryan himself being unable to preside, from the pressure of judicial business. The proposition which was seconded by Dr. Wallich, was as follows:—

' That the office of collector to the Agricultural Society, be hereafter detached from that of Secretary, as was the case before the late Mr. Bell undertook them conjointly ; and that the said office of collector be placed under the control of a special Committee of Finance, who, upon being named, will take into consideration, and report upon the subject of the Society's accounts, and at the same time recommend, who, in their opinion, will be a fit person to be chosen collector, at the next meeting of the Society, when the various standing committees will also be chosen.' And it was further suggested, ' That the following five gentlemen be the members of the Finance Committee, viz. : Messrs. W. F. Gibbon, G. A. Prinsep, W. K. Ewart, W. Storm, and M. Staunton.'

On being put to the vote, the above proposition was carried.

The meeting then proceeded to the ballot, Messrs. Storm and Gibbon being appointed scrutineers, when the following members were declared to be office-bearers for the current year, viz. :

President.—The Hon'ble Sir Edward Ryan.

Vice Presidents.—Dr. Wallich, Mr. C. K. Robison, Nawab Tohowerjung, and Rajah Radhakant Deb.

Secretary.—Dr. H. H. Spry.

The Vice President read a Report of the Committee, appointed at the last general meeting, to examine into the state of the Society's funds. He also drew attention to an account accompanying the Report, which exhibits the state of the finances of the Society to be in the following condition, viz. :

Amount in Government Securities,	20,400
Balance of interest on the same,	416
Balance left by Mr. Bell, in the Bank of Bengal,	894

Total amount to the credit of the Society, on 15th November, 1838.....Rs. 21,710

The Report of the Committee stated the balance remaining in the hands of the late collector, to be Rs. 503.

Read a letter from Major H. J. Wood, (a relative of the late Secretary,) intimating that this sum was held to be paid into the hands of the Society's treasurer.

A statement was submitted by the Acting Secretaries, detailing the particulars of their receipts and disbursements during the period that they have had charge of the Collector's office.

MOTION OF WHICH NOTICE WAS GIVEN BY THE PRESIDENT AT THE LAST MEETING.

‘That the sum accruing in the hands of the Treasurer to the Society, from the period of the death of our late lamented Secretary to the appointment of a successor, be presented to the widow of the late Mr. John Bell, as a slight token of the deep sense which the Society entertains of the indefatigable exertions of its late Secretary to promote the interests and prosperity of the Society.’

The above motion was put to the vote, and carried unanimously.

NOTICE OF MOTIONS.

No. 1.—Moved by Mr. H. M. Parker, seconded by Mr. N. Alexander,—

‘That taking into consideration the duties expected to be performed by the Secretary of the Society, the salary be fixed at three hundred rupees per month.’

No. 2.—Moved by Dr. O’Shaughnessy, seconded by Dr. Wallich,—

‘That in addition to the sum already voted, a sum equal to twelve months’ salary be presented by the Society to the widow and orphan daughter of our lamented Secretary, the late Mr. Bell.’

Proposed by Mr. Storm, seconded by Mr. Thomas Brae, and carried unanimously,—That a vote of thanks be recorded by the Society to Messrs. Robison and Wallich, for having undertaken conjointly the duty of Secretary, till the appointment of a successor to the late Mr. Bell.

From the length of time occupied in deciding the previous business of the meeting, and in consideration of the lateness of the hour, it was proposed by Mr. Robison, seconded by Mr. Willis, and resolved,—That this meeting be adjourned to Wednesday next, the 16th January, at half-past 9 o’clock, for the consideration of the questions and papers of importance which remain to be brought forward.

N. WALLICH, M. D.

V. P. and Acting Joint Secretary.

JANUARY 16, 1839.

Agricultural Society of India.

An adjourned General Meeting of this Society was held in the Town Hall.

Present.

N. Wallich, M. D., F. R. S., V. P., in the Chair.

Messrs. G. A. Prinsep, W. F. Gibbon, M. Staunton, C. Trebeck, P. Sutherland, A. Harris, D. E. Shuttleworth, D. W. Speed, D. C. Low, and F. L. Beaufort; Doctors H. H. Goodeve and H. H. Spry.

The Vice President prefaced the business of the day, by mentioning that at the last general meeting, the consideration of many questions, and papers of importance were settled should stand over for discussion at an adjourned meeting, in consequence of the lateness of the hour, and that they had now to dispose of such arrears of business merely. Dr. Wallich then stated to the meeting, that the subject that would first engage their attention was the annual election of members to act upon the several standing committees of the Society.

The Meeting accordingly proceeded to the consideration of this matter, and submitted the following amended list of members for committees (10 in number) for the year 1839.

Standing Committees.

SUGAR.

Messrs. N. Alexander, W. F. Fergusson*, Dwarkanauth Tagore, D. Hare, A. Muller, G. U. Adam, A. Muller, J. Allan, W. Storm, J. W. Masters, and Dr. H. H. Spry†.

COTTON.

Messrs. Jos. Willis, Chas. Hufnagle, W. K. Ewart‡, G. A. Prinsep, W. Storm, D. B. Syers, W. Earle, G. U. Adam, and Dr. H. H. Spry.

* In the room of Mr. A. Colvin gone to Europe.

† Ex-officio member of each committee in the room of the late Secretary.

‡ In the room of Mr. W. Speir gone to Europe.

SILK, HEMP, AND FLAX.

Dr. O'Shaughnessy, Messrs. R. Watson, C. K. Robison, Ramcomul Sen, J. Willis, D. W. H. Speed, G. T. F. Speed, W. Storm, and Dr. H. H. Spry.

COFFEE AND TOBACCO.

Drs. Strong and Wallich, Messrs. G. A. Prinsep, C. Trebeck*, Thos. Leach, D. W. H. Speed, D. Hare, and Dr. H. H. Spry.

IMPLEMENTS OF HUSBANDRY AND MACHINERY.

Col. D. McLeod, Capt. W. N. Forbes†, Messrs. W. Cracroft, Ramcomul Sen, C. K. Robison, Rajah Radhakant Deb, Chas. Huffnagle, D. Hare and Dr. Spry.

CAOUTCHOUC AND OIL SEEDS.

Drs. Wallich and O'Shaughnessy, Messrs. Ramcomul Sen, Rajah Radhakant Deb, J. P. Marcus, Drs. Corbyn and H. H. Spry.

IMPROVEMENT OF CATTLE.

Messrs. N. Alexander, C. K. Robison, Dr. Wallich, Messrs. Chas. Huffnagle, W. Storm, W. P. Grant, C. R. Prinsep, W. F. Gibbon, A. Harris‡, and Dr. H. H. Spry.

COMMITTEE OF PAPERS.

Dr. Wallich, Messrs. W. Cracroft, W. Storm, W. K. Ewart, M. A. Bignell, and Dr. H. H. Spry.

AGRICULTURAL COMMITTEE.

Dr. Wallich, Messrs. W. Cracroft, W. Storm, Chas. Huffnagle, W. F. Gibbon, Thos. Leach, and Dr. Spry.

GENERAL COMMITTEE.

Dr. Strong, Messrs. Jos. Willis, D. Hare, Radamadub Banorjee, Wm. Storm, and Dr. H. H. Spry.

The name of Mr. H. M. Low has been withdrawn, at that gentleman's request, from the *General Committee*, the *Silk Committee*, and *Coffee and Tobacco Committee*. Messrs. Edward Stirling and J. Dougal have been withdrawn in consequence of the former gentleman having quitted Calcutta for the interior, and the latter gone to England.

In all other respects the members of these several committees remain as before, and were requested to give the Society the benefit of their individual services.

* In the room of Mr. H. Walters gone to Europe.

† In the room of Mr. James Prinsep gone to Europe.

‡ In the room of Dr. Jackson gone to Europe.

The Vice President next called attention to the annual exhibition of vegetables, the anniversary dinner, and the cattle shew. Dr. Wallich mentioned that, as a time had been already fixed for the latter, viz. the 1st of February, he would beg to propose that the exhibitions and dinner take place on the same day; and that the details connected with this arrangement be left to the General Committee.

This proposition was carried unanimously.

The Secretary then called the attention of the Society to a Special Report, which had been given in by the Committee appointed at the last general meeting, for the purpose of suggesting the best mode of carrying into effect the contents of a despatch from the Court of Directors to the Bengal Government, touching the productions and prices of articles of agricultural produce at the Chief ~~Man~~ and an obscure village in each district in the empire of Hindustan, which had been solicited of them by the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland; and further suggesting the returns be so arranged as to shew, as far as they possibly could, the course of trade geographically, both internal and external.

The following is a copy of the letter which accompanied the communication from the Secretary to Government in the General Department:—

To the Agricultural and Horticultural Society.

GENTLEMEN,

I am directed by the Hon'ble the President in Council to transmit to you the accompanying copy of a letter, No. 10 of 1838, from the Hon'ble the Court of Directors in the Public Department, dated the 17th August, and of its enclosures, and to request that the Government may be favoured with your suggestions as to the best mode of meeting the wishes of the Committee of the Royal Asiatic Society in the matter referred to.

I have, &c.

(Signed) H. T. PRINSEP,
Secy. to the Govt. of India.

Council Chamber, Nov. 28th, 1838.

PUBLIC DEPARTMENT,—No. 10 of 1838.

Our Governor General of India in Council.

We transmit as a number in the packet the copy of a letter from the Secretary to the Asiatic Society with enclosures, applying for information respecting the prices, &c. of the most ordinary productions of India in various districts, and we desire that you will furnish this information, if it can be procured without much inconvenience.

(Signed by the two Chairs and eleven of the Court of Directors.)

REPORT OF A SPECIAL COMMITTEE.

Report of a Special Committee appointed by the Agricultural and Horticultural Society of India to consider the best mode of carrying into effect the contents of a Despatch from the Court of Directors to the Bengal Government.

In accordance with the wishes expressed by our President and members, at the last ordinary monthly meeting, we have met and considered the subject referred to us for report.

2nd. The execution of the very desirable scheme of the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland, which has been submitted, in the despatch of the Court of Directors of the East India Company, is one that every true friend to the interests of India, must desire to see carried into effect. By inquiries into the nature of the commercial resource of the country, by every possible means, can the agricultural wealth of British India alone be properly developed.

3rd. In the practical fulfilment, however, of this very useful measure; circumstances occur, that demand serious consideration. Formal inquiries, whatever their character, are never made in this country without entailing much real mischief on the people. The utmost caution therefore will be requisite in carrying the wishes of the Committee of Agriculture and Commerce into effect; for the known avidity with which native officials seize on delegated authority, however slight it may be, to impose and extort from their weak and passive countrymen, makes your Committee loath to recommend the adoption of the course that, at first, would naturally suggest itself; namely, that of seeking to procure the necessary local information through the collector or magistrate of the district.

4th. The object may be attained, your Committee think, by less exceptionable means, and it has occurred to them, that, from their well known habits of industry, their greater leisure,—and, generally, the love which they bear to science, the medical officers attached to the political and civil arms of the service might be induced, if so solicited, to impose on themselves a task the completion of which would be attended with so much unmixed good. The researches, if made by them, would be carried on without exposing the people to the risk of extortion, and at the same time the end in view be most efficiently attained.

5th. Your Committee therefore would beg to suggest this mode of procedure as the one best calculated to effect the object desired with the least possible inconvenience to the people; and would propose that the medical gentlemen at agency and zillah stations should be invited to favour the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland, with the best information that they can procure.

6th. A single form of table your Committee consider ill adapted for the conveyance of the information sought, and they have consequently ventured to deviate from the prescribed model, proposing to substitute separate tables for the three great staples of silk, rice, and indigo, and a modified form for the remaining articles. These alterations your Committee now beg to transmit with this report.

7th. In conclusion, your Committee have further to suggest, that, as great practical inconvenience may be felt by the officers preparing statements in turning the customary measures and weights of the different districts into pounds avoirdupois, the seer of the district from which the return is made be adopted in such return, and subsequently converted in Calcutta or in England into avoirdupois.

(Signed) G. A. PRINSEP,
H. M. PARKER,
R. WALKER,

Calcutta, Jan. 7, 1839.

H. H. SPRY, M. D.

Proposed by Dr. Wallich, and seconded by Mr. Gibbon, that this Report be confirmed. Carried unanimously.

Establishment of a Branch Agricultural Society at Dacca.

The Secretary next called the attention of the meeting to a highly gratifying communication which had been received from Colonel Stacy, stating that he had, while at Dacca, purchased a piece of

ground and laid the same out for the propagation of cultures of various kinds; but that being recently honored by the Commander-in-Chief, with the command of a regiment of the army of the Indus, he had signified his desire to the principal European residents at Dacca, of making the above garden over to them in perpetuity should they be disposed to undertake the management of it, and form themselves into a '*Branch Society of the Agricultural and Horticultural Society of India.*' This proposition had been most willingly acceded to by Mr. Cooke (judge of Dacca), George Lamb, Esq. (civil surgeon), James Grant, Esq. (magistrate), and J. P. Wise, Esq. (indigo planter), who have constituted themselves a committee and received charge of the title deeds, seeds, pumps, tools, &c.

Resolved,—That a special vote of thanks be given to Colonel Stacy for his great personal exertions in the cause of agricultural science.

On the Culture of Silk by standard Mulberry Trees.

Signor Mutti, who has recently been appointed Superintendent of silk culture in the Deccan by the Bombay Government, has transmitted two highly interesting statements, calling the attention of the Society to the principal faults in the mode of conducting the culture of Silk in Bengal, and the great advantage to be expected in substituting the *standard mulberry tree*, in the place of the *bush system*. "The three principal faults in the Bengal silk culture" Signor Mutti states to be, "1st, the system of training the mulberry as a bush or shrub; 2nd, in rearing of the silk-worm; 3rd, in the reeling of silk. And I would respectfully remark, that in Bengal several prejudicial opinions exist regarding the method of training the mulberry as a standard tree; viz:

"1st. It is said that by feeding the worm with the leaf of the tree, the silk becomes coarse.

"This is plainly contradicted by the fact, that in Italy, where the finest silk in the world is made, the worms are fed only with the standard leaf. I myself here find that by following the same Italian plan, I get the best cocoons and finest silk.

"2nd. It is said that the leaf of the tree being hard, the worms do not eat it.

"This clearly shews, that as the worms are not properly reared, they become weak, and therefore have not strength enough to subsist upon hard leaves.

" In Italy not only are the worms fed with the leaf of the tree, but we make there also a difference and distinction in the leaves, paying more for those of an older tree and hard ones, and it is also to be borne in mind, that in this climate this insect for a part of the year ought to be more healthy and stronger than there, where only by artificial means and precautions, we are able to keep it up.

" 3rd. It is said that the standard-mulberry does not succeed in Bengal, it having been tried but without success.

" The very same thing was said here some years ago regarding the Deccan and Conkan, but experience has now proved the contrary.

" It was just for the sake of removing the prejudice which existed on the subject, that I undertook to train fourteen species of mulberries as standards, among which there were several of very base descriptions and bushy, including the China divided leaf, and every one has astonishingly succeeded, five standard trees, with large stems, branches, &c.

" The only inconvenience I had was, that they gave me a great deal more to do than the other good species. They succeeded not only in the Deccan, but in Bombay and Salsette, where the climate in some places is approaching to the Bengal, but with this disadvantage, that it is not so moist and damp as in Bengal, which is a very grand thing.

" It is said, that with the bush system, silk can be made five or six times a year, whereas with the tree, only three or four.

" True it is, but it is also a fact that—1st. The result of the worms fed with the bush leaf will not produce as much as that fed with the standard leaf.

" 2nd. With the bush system, a person is engaged all the year round in rearing worms and winding silk, and after all does not make so much silk as the other, who uses the tree.

" 3rd. The bush requires for ever expense and trouble, which is not the case with the tree, as after a few years nothing is required for the latter except pruning and thinning, which labour is amply repaid by the wood obtained and this certainly is a very great object, saving money and labor. For the proprietor of the land having standards in his ground the place is a valuable one, it is actually a capital that he has got, and the income which he yearly derives from such estate is far superior than if it is planted with bush."

Mysore.

An exceedingly encouraging document was read by the Secretary, from Lieutenant Munro, dated Bangalore, Nov. 3rd, detailing the

progress that had been made by the Agricultural and Horticultural Society of Mysore. Many of the experiments made in the introduction of new, and improvement of old cultures, had surpassed the expectations of the most sanguine of the friends of agricultural science. One or two of the more striking items among the many which fill the report are these :—" In the fruit department, the principal care has been to teach the native gardeners how to prune. No new fruits or varieties have been introduced, but the good ones have been increased.

" That the apple is deserving of cultivation in a lucrative point of view, is evident from the fact mentioned at a former meeting of Sergeant Master's having realized in nine months, by apples, upwards of seven hundred rupees.

" Mauritius sugar-cane has thriven remarkably well, and is the admiration of all the natives who see it. Experiments have been tried with various manures which already prove that sheep's dung is by far the best.

" The manufacture of vinegar from the juice of the cane is likely to be a great source of profit.

" Coffee has succeeded admirably.

" I have derived great benefit from the use of the hot bed, as I scarcely ever fail in raising seeds from England which in former times seldom, if ever, vegetated in greater proportion than one in twenty.

" Experiments have been made in boiling seeds, which have greatly quickened their vegetating powers.

" I made during last season some curious experiments with mercury. Many of the apple trees were infested with a black disease, which destroyed the trees rapidly. I bored holes through the wood as far as the pith, and filled them with mercury. In no single instance did it fail to stop the disease."

The special thanks of the meeting were voted to Lieut. Munro, for his highly interesting communication, which was ordered to be made over to the Committee of Papers.

Cotton in Assam.

Captain Jenkins, the Governor General's Agent for the affairs of Assam, drew the attention of the Society to the increasing importance of cotton cultivation in Assam, and requested that as the foreign varieties of seed which had been furnished to him did not appear to succeed, he might be furnished with the better kinds of country

seed. The Cotton Committee were requested to give the Society the benefit of their earliest consideration, in order that Captain Jenkins' communication may meet with the best attention.

A New Culture.

The Meeting were favoured by Miss Davy, with specimens of a thread prepared from the pine-apple plant which grows wild in some parts of Assam, and drawing attention of the members of the Society to the value which the beautiful texture of the thread was likely to prove in the manufacture of the finest fabrics. Along with the unmanufactured thread were specimens of the finest French caubric, to shew that in no respect did the texture of the thread of the latter surpass that of the former.

The exhibition of these specimens excited great interest, and it was resolved that the whole should be transmitted to the Committee of Agriculture and Commerce of the Asiatic Society of Great Britain and Ireland, in order that the same may be submitted to the inspection of manufacturers and the intrinsic value of thread obtained.

The Secretary was directed to convey to Miss Davy, the best acknowledgments of the Society for her valuable communication. (Vide No. 1.)

Resources of the Tenasserim Provinces.

Two valuable papers by Mr. Riley, pointing out the great agricultural capabilities of Amherst and Moulmein for the production of coffee and other valuable staple articles of commerce were next read by the Secretary, and two models of mills for the preparation of the coffee seed of commerce, were also shewn. The first was for crushing the ripe berry, and was capable of grinding nearly 8,000 lbs. of coffee daily. The second was for detaching the husk, and was stated to be capable of turning out 10,000 lbs. of coffee fit for the market daily. Each mill is worked by one or two buffaloes.

The Secretary also read letters from Mr. Ballestier, forwarding a sample of Muscavado sugar, to be entered for competition for the Society's sugar prize.

From Messrs. G. T. F. Speed and D. W. H. Speed, the former communicating some interesting particulars connected with the flora of Darjeeling, and forwarding for the Society's museum specimens of the acorn of the Indian oak, and ears of Indian corn which he had brought from that settlement; and the latter, presenting to

the Society a jar of arrow-root, prepared from the third season's bulbs of the *Maranta Arundinacea* brought to India by Lord Auckland. The thanks of the meeting were duly accorded to these two gentlemen for their respective contributions. (Vide Nos. 2 & 3.)

A letter from C. B. Greenlaw, Esq., Secretary to the Marine Board, was read by the Secretary, forwarding specimens of hemp made from the '*Senseviera Zeylanica*,' the '*Moorba*' or '*Moorva*' of the natives, and mentioning that orders had been given to try the strength of rope made from this substance, which, if successful, would be manufactured for the use of Government on a large scale. (Vide No. 4.)

A letter from Professor Royle, Secretary to the Committee of Agriculture and Commerce of the Royal Asiatic Society, forwarding for presentation to the Society, a few samples of South American maize, received by their Committee, from Dr. Lindley, Secretary to the Horticultural Society of London, was next read by the Secretary.

From Jeffrey Finch, Esq., Shahpore Oondee, Tirhoot, dated November 19th, presenting more grafts of apple trees for the Society's fruit-tree nursery. Dr. Wallich here took occasion to remark, that the nursery had flourished so well, that the Committee would be shortly prepared to furnish supplies to members requiring them.

From Charles Cardew, Esq., presenting a parcel containing an assortment of grass seeds, which he had just brought from England.

From Colonel Stacy, forwarding a quantity of African grain, alluded to in a former letter.

For all these communications the best thanks of the meeting were offered.

Letters were read from the Secretaries of the Branch Societies of Gowhatti, Azimghur, and Moorshedabad, inquiring after the silver medals which had been placed at their disposal for distribution. The Secretary informed the meeting that he had seen Mr. Curnin, who had told him that the medals were in course of preparation, and that no effort should be spared to have the whole ready for delivery on the night of the anniversary dinner.

A copy of the sixth Report of the Royal Horticultural Society of Cornwall was presented by Dr. Wallich, on the part of Capt. Jenkins. The *Madras Journal of Literature and Science*, No. 21, was also laid on the table.

HENRY H. SPRY, M. D.

Secretary.

FEBRUARY 13, 1839.

Agricultural Society of India.

A General Meeting was held in the Society's Rooms, Town Hall,
on Wednesday, the 13th February, 1839.

The Hon'ble Sir E. Ryan, President, in the Chair.

MEMBERS ELECTED.

The following gentlemen proposed at the Anniversary Meeting were elected members, viz. :

Messrs. T. P. B. Biscoe, C. Scott, Jas. Wood, R. Wooldridge, and Dr. R. H. Bain.

MOTIONS OF WHICH NOTICE WAS GIVEN AT THE LAST
MEETING.

The attention of the Meeting was first called to the consideration of the motion made last month by Mr. H. M. Parker, namely, 'That taking into consideration the duties expected to be performed by the Secretary of the Society, the salary be fixed at three hundred rupees a month.' The members who addressed the Meeting were the President, Mr. Parker, Mr. Cracroft, and Dr. Strong. Their sentiments were all confirmatory of the propriety of the proposition, which was carried unanimously.

During the discussion of the above measure, the President took occasion to remind the Society that the Secretary had expressed his willingness to undertake to do the duty of the Collector's office, and read the report of the Committee of Finance, in which his offer had been embodied; so that it was for the Society to determine whether it would be desirable that the two offices should be separated or not

—if the latter, then he would propose that Mr. Blechynden, who had shown himself to be a very useful Assistant Secretary, should be made Collector of the Society, with an increase to his salary of 50 rupees a month. Further, that the gentlemen who formed the Special Finance Committee, be requested to continue their services as a Standing Committee of the Society, and that they should take cognizance of all matters bearing on the 'ways and means' of the Society.

The statement of 'the ways and means' which the Special Committee had prepared showed a disposable balance of about five thousand rupees without encroaching on the 'fixed assets' which left no doubt of the capability of the Society to afford this extra expense, if the proposition were carried.

The sense of the Meeting being confirmatory of this step, notice of a motion was given, which will be found below.

The second point which engaged the attention of the Meeting, was the proposition of Dr. O'Shaughnessy, also submitted at the former assembly of the Society, 'That, in addition to the amount already voted, a sum equal to twelve months' salary be presented by the Society to the widow and orphan daughter of our lamented Secretary, the late Mr. Bell.

Dr. O'Shaughnessy addressed the Meeting in a few impressive words, in support of his proposition, and reminded the Society, that for a period of three or four years, while the Society were low in circumstances,—the late Mr. Bell gave his unremitting energies gratuitously to the advancement of the interests of the Institution; and that now that the Finances were so flourishing, they could well afford to grant to the widow and fatherless child, this substantial proof of respect entertained by the Society, of the worth and services of their deceased Secretary.

Dr. Wallich likewise asked for the grateful sympathy of the members, by giving their support to the vote. The motion was then put from the chair, and carried unanimously.

The President then adverted to a notice of an important motion which had been submitted by Mr. G. Prinsep, to be brought forward at the next Meeting for discussion as that gentleman was unable to be present now. It referred to the reward which the members of the Court of Directors had published to encourage the propagation of the Cochincal insect in their possessions in the East Indies.

NOTICE OF MOTIONS.

No. 1. Proposed by Mr. G. A. Prinsep, seconded by the President, 'That as it appears from documents laid before the Society, that since the year 1807 a resolution of the Court of Directors has continued unrepealed, offering a premium of £2,000 for the introduction of the live Cochineal insect of the fine species into their Indian Territories in a state fit for propagation; application be made to this Government to grant that sum (or 20,000 rupees) to the Society, on the ground of their having, by their arrangements, and at their own expence, effected the object for which that premium was offered by the Company; but under an engagement that the whole sum shall be devoted to the propagation of the Cochineal in different parts of India.'

No. 2. Proposed by the President and seconded by Mr. Piddington, 'That the gentlemen who constituted the *Special* Committee of Finance, be considered a *Standing* Committee for the regulation of all matters connected with the pecuniary transactions of the Society, and that the Assistant Secretary be the Collector of the Society under them, on a salary of fifty rupees a month in addition to his present income of one hundred and fifty rupees.'

The Secretary brought forward a list of gentlemen to be proposed, as members of the Agricultural and Horticultural Society of India. Before the names were read, the President requested to allude to a very interesting letter which he held in his hand from his Excellency the Right Honorable Stewart Mackenzie, Governor of Ceylon, of which the following is the substance. The letter was addressed to the late Secretary.

"*Queen's House, Colombo, Jan. 17, 1839.*

"With regard to your Transactions, I certainly place a very high value upon their publication, and am confident, that by increasing the intercourse throughout the interior of India, and by the continuation and extension of the labours of your own, and similiar Societies, more real good and advancement of the essential comforts, in clothing, and other luxuries, amongst the population of India in general, will be thereby ultimately effected, than has been during our past connexion, with the people of that country. The same doctrine is most applicable also to this island, and if I can open up its resources, by roads, canals, &c., in all directions, and effect the introduction of such an institution as you have recommended, I am well aware how essen-

tially beneficial it would be to this island. It is a vast encouragement to any Society commencing its operations, to have the advantage of communicating freely with one, like the Agricultural Society of India, whose Transactions and Reports you have laid me under so much obligation by presenting to me. The recent establishment here, within the fort, of a small Horticultural Society will, I hope, gradually grow up into one of the character, which you have pointed out.

"I shall feel highly gratified if Sir E. Ryan does me the honor, as you suggest, of proposing me a member of the Agricultural and Horticultural Society of India, though should that be irregular, it will by no means diminish the real interest I take in that most valuable INSTITUTION."

Adverting to the interest thus expressed by His Excellency in promoting the advancement of the great objects of the Society, the President asked whether the Agricultural and Horticultural Society of India would not be testifying their sense of approbation of His Excellency's sentiments as expressed in his letter more fully by enrolling his name among the Honorary Members of the Society, instead of putting him in nomination as an ordinary member. The Meeting approved of the suggestion thrown out by the President, and it was therefore 'Proposed by the President and seconded by Dr. Strong,' that His Excellency the Right Honorable Stewart Mackenzie, be put in nomination as an Honorary Member of this Society.

• *For election as Ordinary Members.* •

The Honorable Sir Henry Seton, John Trotter, Esq., C. S., and G. W. Johnson, Esq., Barrister, proposed by the President, and seconded by Dr. Wallich.

Woolriche Whitmore Ryan, Esq., proposed by Dr. Wallich and seconded by Dr. Spry.

Francis Curwen Smith, Esq., C. S., proposed by Dr. Spry, and seconded by T. P. B. Biscoe, Esq.

Wm. Sinclair, Esq. (Chundry, near Maldah,) proposed by Wm. Storm, Esq., and seconded by P. Macarthur, Esq.

J. W. Cragg, Esq., proposed by Wm. Storm, Esq., and seconded by Dr. Spry.

Captain Fenning, Artillery, and Lieutenant Burnett, Artillery, proposed by Dr. Spry and seconded by Dr. Wallich.

Arnold H. Matthews, Esq., (Arumchund, near Allahabad,) proposed by John Donald, Esq. and seconded by Dr. Spry.

Allen Campbell Dunlop, Esq., proposed by D. Hare, Esq. and seconded by Dr. Wallich.

The Annual Report for the past year, on the condition of the Society, was submitted by the Secretary, and will be printed in the monthly proceedings of the Society.

The report of the Cotton Committee recommending the purchase of the better sorts of indigenous cotton seed for transmission to Captain Jenkins, the Governor General's Agent in Assam, was next read.

The award of the Cattle Committee at the exhibition on the 1st instant, was laid on the table.

It was proposed by Mr. Cracroft, seconded by Mr. Piddington, and resolved, 'That the Cattle Committee be requested to lay before the next Meeting for discussion, what prizes they may recommend to be offered for the importation of cattle and sheep, specifying the amount of each, and the description of the animals.'

A list of the prizes awarded to native gardeners at the Annual Horticultural Exhibition on the 1st instant, was also laid on the table.

After this the Secretary circulated round the table, the various presents which had been forwarded for the Library and Museum of the Society.

LIBRARY.

1st. *Six copies of "the Report of the Committee, appointed at a Meeting of the Agricultural Society on the 3rd day of August 1838, to take into consideration the present state and condition of the Colony of Western Australia: embodying a statistical report drawn up to the end of June 1837, with a supplement to the close of the year, by His Excellency Sir James Stirling, Governor."* Transmitted by A. Wayler, Esq., Honorary Secretary, on the part of the Western Australian Agricultural Association.

Printed at Perth, Western Australia.

2nd. A pamphlet by Mr. H. Piddington, '*On the Scientific Principles of Agriculture, considered as a branch of public education in India*;' presented by the author.

3rd. *Two copies of 'the proceedings of the Agricultural and Horticultural Society of Bombay';* presented by the Society.

(Note.—From a paragraph in the preface to this report, it would seem that the support which the Agricultural and Horticultural

Society of India derived from the Supreme Government, was over-estimated by the Bombay Society. What the Agricultural and Horticultural Society of India do at present get, is the sum of 2,675 rupees annually.)

4th. A copy of '*Transactions of the Society of Arts*,' Part 2nd, Vol. 51; presented by the Society.

5th. '*New England Farmer*,' Vols. 15 and 16 (6 and 7 of New series), presented by Dr. Wallich.

MUSEUM.

1st. *Varieties of Barley and Rye, grown on the Estates of several settlers at Swan River; also, specimens of Wool from 2 Saxon Rams, which were sold at public auction for 8 and 10 guineas:* presented by the Western Australian Agricultural Society.

2nd. *A sample of cloth, made from cotton, the produce of seed sent by the Society, to Suddiya, Upper Assam:* presented by Dr. Wallich, on behalf of Capt. Jenkins.

3rd. *A sample of cotton produced at Hidgelce from Seychelles seed, furnished by the Society:* presented by Dr. Alexander Smith.

(Note.—The two last named articles were highly approved of by the members who were present. The staple of the latter was considered particularly good.)

4th. *Sugar-canes, grown from Otaheite stock, in the garden of the Nizamut at Moorshedabad:* presented by Captain Pemberton, Agent to the Governor General, on behalf of his predecessor, Colonel Caulfield.

5th. *Specimens of Grain, ('Ouse Dhan,')* presented by the Branch Society of Assam.

The thanks of the Meeting were voted to the different donors for their various contributions.

Mr. Piddington submitted for inspection an instrument called Pyknometer 'for testing the exact point to which sugars of all kinds, whether from cane or goor, should be boiled.' As a proof of the accuracy of this instrument Mr. Piddington states—'that of about twelve thousand maunds of goods, mostly of low quality, (and these are the most liable to failure,) only two hundred and ninety had to be re-boiled.'

COMMUNICATIONS.

1.—*Agricultural Statistics.*

The first communication submitted to the Meeting was a letter from Government, requesting that the Society would undertake the management of the scheme recommended in the Special Report recently made by the Society to the Government as to the best mode of obtaining the price of produce throughout the empire.

To H. H. SPRY, Esq., M. D.

Secretary to the Agri-Horticultural Society.

SIR,

I am directed to acknowledge the receipt of your letter dated the 19th instant, submitting the Report of a Special Committee appointed by the Society on the best means of procuring local information in respect to the prices, &c. of agricultural products of India.

2 In reply, I am directed to state, that his Honor the President in Council has ordered the Lithographic Committee to give you the aid of that establishment in preparing forms and statements for circulation to the medical officers, and will be happy to learn, that the Agricultural and Horticultural Society can procure from the medical or any other officers the information required by the Statistical Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland. His Honor in Council cannot think that the objects of the Society would be effected with sufficient care by imposing on the public officers, the necessity of furnishing the statements suggested in addition to the business already entailed upon them.

I am, &c.

(Signed) H. T. PRINSEP.

Sec. to the Govt. of India.

Council Chamber, Jan. 23, 1839.

The Meeting was not indisposed to undertake the extra labour which the Government had thus delegated to them, and as far as their services went, it should be cheerfully given. The members, however, considered, that the Government in common fairness ought to hold the Society free from any expense, and it was determined, that the Secretary should, before commencing operations, address a letter on the subject to the Chief Secretary, requesting that besides the use of the Government Lithographic Press, which had been placed at the disposal of the Society by his Honor in Council, the trans-

mission of letters free of postage to and from the interior should also be conceded, as well as any other privilege, the withholding of which might cause an expense to the Society.

James Pattle, Esq. therefore proposed, Dr. Wallich seconded, and it was resolved—that the Special Committee remain as now constituted, and give the Society the benefit of their services. Mr. Ewart suggested, that the name of Dr. D. Stewart be added to the Committee, which was done.

2.—*Sugar-Cane from the Island of Otaheite.*

His Excellency Rear Admiral Sir Frederick Maitland announced to the Society through his Secretary, “ that Captain Nias, who will on his arrival in India, proceed to New South Wales in H. M. Ship *Herald*, to assume the duties of Senior Naval Officer on the Coast of Australia, will be furnished with a copy of the (late) Secretary’s letter, and instructions of the Society for packing the canes, and with His Excellency’s orders to further the objects of the Society as therein expressed, as far as the service upon which he is to be employed will admit.”

3.—*Caoutchouc and other Products.*

Committee of Agriculture and Commerce of the Royal Asiatic Society.

Professor Royle, Secretary to the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland, in a letter to the address of the late Secretary, calls the attention of the Agricultural Society of India to concerns of great importance connected with the resources of the country. The letter and the discussion which ensued, excited great interest.

Royal Asiatic Society, Grafton Street, Bond Street, Oct. 27, 1838.

“ You wish to know what are the more immediate objects of our Committee. Its title is a bad one as we cannot here do any thing for the Agriculture of India, except co-operating with and assisting you.

“ In Mr. Holt Mackenzie’s and my proposal for the formation of this Committee, you will see the general objects touched upon which we contemplated in its formation. On Mr. Mackenzie becoming the Chairman, he addressed the members on the more precise *present* objects of the Committee,—that is, the investigation, chemical examination, and practical application of the different products of India, likely to be useful to manufacturers here. As I have not time myself

my assistant, Mr. E. Solly, makes a chemical analysis of the different substances we obtain, and then see to what substances, already in use, by manufacturers, they are analogous. They are then presented to manufacturers interested in the kind of product, and these are very willing to submit them to further practical experiments and ascertain if they will answer the purposes of their trade or manufacture. Several very interesting results have already attended this mode of proceeding. I need not allude to the Caoutchouc, which your Society so actively took up, and the zealous and talented officers in Assam have so successfully carried out. You have been addressed on the subject by the Secretary of the Caoutchouc Company, as well as by Mr. Sievier, and I have written to Dr. Spry and previously to Dr. Wallich, who will no doubt make the contents known to your Society as far as they can be of any use to the Society or Collectors. I may repeat that there is not the smallest doubt of this becoming an extensive article of Indian Commerce, if managed with moderate prudence. The London Caoutchouc Company are willing to purchase all that is produced at prices of course proportioned to the quality.

"I have also written to Dr. Spry* for some Burmese varnish (*Chetsee*) which is also found in Munnypore and called Khew, (vide

* *Extract of a letter, from Professor Royle to Dr. Spry.*

London, October 27, 1838.—"There is still some doubt about the Assam caoutchouc as at present prepared whether it is fit for cutting into the finest thread or strong enough for that required for ropes for machinery, &c. But this can only be a doubt for a time as I feel well satisfied that from the quality of the rubber that it will eventually, nay very soon, be prepared of quite as fine, strong, and elastic a quality as the best from Para. Even at the price at present procurable, it must be a remunerating one and it may be nearly doubled or more by careful preparation. I hope you have enlightened the people on the subject of the necessity of preparing it in layers. The process is tedious and laborious if you please, but it is the only manner we at present know in which strength and elasticity are fully attained.

"The bottle or cylindrical form was required because there was no other way of cutting it into threads then known. But a knife has been invented and patented, and which the Caoutchouc Company have bought for £2,500 which enables a person to cut flat pieces into thread with the same facility that you saw done, when in London, with the circular pieces. So that now you may instruct your correspondents to prepare in *flat pieces* if more convenient, as the less bulk it will occupy will be a further advantage in carriage and freight. But be particular in still enforcing the rubber being prepared in layers free from porosity or moisture as in this alone depends the highest price being paid.

Wallich ;) as well as for some wood oil (*Gurjun*) and both Persian and Rangoon Petroleum, if procurable, for the sake of experiment. In the *Athenæum* and *Literary Gazette* you may have seen reports of the analysis by Mr. Solly of the astringent gum of the *Dhak Pulass* or *Butea frondosa*, which is so common all over India. Mr. Brewin, an extensive tanner has called upon me and made trial of some which I recommended to Mr. Beckett late of Allygurh. He approves of it highly and would gladly get 20 tons if he could get any intelligence respecting the price, but I have no doubt it might be afforded at the same rate as Catechu (*Kath*) ; it would be an experiment well worthy trying. If you were to make the fact known of its being in request, residents all over India might be induced to collect it.

“The Barbary wood and root is also in demand here. The supply from the South of Europe fails, and the dyers want it much. We have had some Barbary root from Ceylon tried here. It is pronounced superior to any in the market : I have suggested that the extract which is made in the hills and sold in the bazars by the name of *rasout* might be tried as a dye. Mr. E. Solly's paper on this Barbary will be among the first read when our meetings commence next month, and I shall address you on the subject, as well as on that of the *Butea kino*, which might, I think, also be prepared of a superior quality for medicinal use, as it is particularly eligibile from the conjunction of astringent with gummy principles. As the Barbary is no doubt common in the hills near Capt. Jenkins, will you suggest to him the subject as well as of the *Butea kino*.

“I have written to Dr. Falconer and Capt. Cautley for articles from Northern India.

“You will be tired of all the above instructions ; but I see the people in India complain, first of not knowing in what form a thing is best suited for the market here, when a form is sent and a mode recommended it is found fault with as being tedious and not complied with.

“With respect to the quantities required here I believe there will be no limit to the demand. * *

“If they attempt to raise the price above what is fair it will recoil upon themselves as the South American will immediately be bought and reduce the price again ; and the West India proprietors are growing the caoutchouc tree on their estates. But there is room for all. Has any one thought of my suggestion of planting the *Ficus Elastica* all over the country. It yields good caoutchouc up as high as Saharunpore.

“The *kino* of the *Butea* or *Pulass* or *Dhak ke gond*, is likely to be in great demand.”

"The seeds have been received from Dr. A. Campbell and I will make some observation on them on some future occasion."

Dr. O'Shaughnessy begged permission to remark, that he had made *three* of the *four* articles mentioned by Dr. Royle, the subject of extensive experiment. For specimens of the black varnish of Burmah and of Assam, Dr. O'S. was indebted to Dr. Wallich. He applied it to leather, wood and metal, and found that in richness of color, flexibility and impermeability to moisture it was in every respect equal to the article employed by the patent leather manufacturers in Europe. The "*Gurjun*" or "wood-oil" Dr. O'S. observed was properly speaking a balsam obtained from several species of *Dipterocarpus*, common in many parts of India. By distillation this balsam yields volatile oil, a resin being left behind. The oil Dr. O'S. found to be isomeric or identical in chemical composition with that of the Balsam of Copaiba, and he had accordingly used it extensively in his hospital with exactly the same medicinal effects. He had sent specimens to England by Mr. Johnson of the "*Catherine*" now leaving this port. Not only was this article likely to become of importance in Medicine, but also in the Arts in many of which Copaiba is now used. While Copaiba by the latest "*Drug Price Current*" was at 5 shillings and 6 pence the lb., twenty lbs. of the essential oil of *Gurjun* may be obtained of the very best quality for about ten shillings.

The *Rasout* alluded to by Dr. Royle and which that gentleman was the first to discover the source, Dr. O'S. noted to abound in a rich and valuable yellow coloring matter. It was moreover of great efficacy in the treatment of intermittent fevers. It would readily be obtained for from 4 to 6d. the lb. by proper arrangements in the districts where the Barbary is found.

Two Reports, from Mr. Sievier, Manager of the London Caoutchouc Company, were brought to the notice of the Meeting.

4.—*Cochineal*.

The Secretary communicated a most acceptable piece of intelligence regarding the prospect of an early supply of fine grained cochineal insects and nopal from the Isle of Bourbon through the kindness of Monsieur Bedier, Commissioner of Marine Affairs at that island.

“J’ai recut tout récemment votre lettre du 39 Aout dernier. Vous n’avez pas à craindre de commettre, d’indiscrétion en réclamant de mon zèle pour votre Société. Je vais m’occuper avec M. Richard à vous préparer un nouvel envoi de cochenille et de nopal, mais afin d’en assurer le succès, nous attendions, pour vous l’expédier le retour de la mousson du S. O. pendant laquelle les traversées d’ici au Bengale sont très courtes. Il est peu probable que des cochenilles qui vous seraient envoyées dans ce moment pourraient supporter la longueur d’un voyage de plus de 90 jours. Soyez du reste bien convaincu que nous continuerons à vous faire des envois jusqu’au moment où vous serez assuré de la propagation de ce précieux insecte au Bengale, ayant le vif désir de contribuer à procurer à votre immense population cette lucrative et importante culture.”

5.—*A New Branch Society at Backergunge.*

The Secretary read a note from F. Stainforth, Esq., the Judge at Backergunge, communicating the intelligence of the residents at that station being about to establish a Branch Society there, and asking “what assistance the Parent Society is disposed to render.”

The Secretary informed the Meeting that as Mr. Stainforth’s letter was pressing, he had ventured to reply to it by return of post, and had intimated that the Society would be willing to contribute to the Backergunge Branch Society the support which was afforded to the other Branch Institutions, namely, two silver medals and fifty rupees annually.

6.—*Mysore.—School for Gardeners.*

A copy of the Proceedings of two Meetings of the Mysore Agricultural Society was laid before the Society. (See Appendix.)

7.—*Egypt.—Cotton and Indigo Seed.*

A letter was read by the Secretary from Mr. Waghorn at Cairo, offering his services to assist the Society in procuring more cotton and other seeds. Mr. Cracroft spoke of the superiority of the Egyptian Indigo seed, and proposed that a small quantity should be obtained which was agreed to.

A letter from Mr. Chambers, of Calcutta, was submitted by the Secretary, requesting to be supplied with cotton seed for transmission to the Swan River. The Secretary stated, that he had complied with the request, and had furnished Mr. Chambers with a parcel of Seychelles and Egyptian seed.

8.—*Western Australia.*

The letter of Mr. Wayler, Honorary Secretary to the Western Australian Agricultural Society, was also read.

“A communication with India has always been a desire of primary consideration, and its tardy accomplishment has almost precluded expectation in the minds of many. It was anticipated that from that quarter, labor might be drawn to any extent, and it is to the want of such invaluable assistance, that we are making no more rapid progress than we are doing; few will venture to improve or cultivate to the extent of their means, from the uncertainty of gathering the produce of their labors, while the extortionate demands of such of the working class, as may be procured, exhaust the profits of farming operations. Still we *are* progressing, and under such varied disadvantages, at a rate, that is the surprise of all who visit our shores. That many may be induced to become not only visitors, but fellow-colonists, from your less salubrious climate, is the ardent wish of us all.”

Before the Meeting broke up, the Secretary called the attention of the Society to the necessity of adopting measures for obtaining a new die for the Society's medals, the present die having a flaw in it. Mr. Cracroft was so good as to mention that as he was about to sail for England shortly, he should be happy to take charge of any commission he might be intrusted with by the Society, that he should willingly attend, at all times to any request he might receive as to the purchase of English seeds and so on, and that as the great expense of a new die for the Society's medals was now the chief consideration, he should be happy, as soon as he reached London, to consult Mr. James Prinsep on the most economical mode of proceeding. The Meeting expressed themselves grateful to Mr. Cracroft for his polite offer, and willingly accepted it.

It should be mentioned that to the whole of the numerous correspondents who had favored the Society with their communications, the thanks of the Meeting were accorded in the order in which they were read.

HENRY H. SPRY, M. D., *Secretary.*

APPENDIX.

*Mysore Agri.-Horticultural Society.**To the Secretary to the Agricultural Society of Bengal.*

DEAR SIR,

Enclosed I have the pleasure to forward to you a copy of the proceedings of two meetings of the Mysore Agri-Horticultural Society. I regret that we have lost our late able Secretary Lieut. Munro by the removal of his Regt. from the station; and the loss of many subscribers has very much reduced our means of usefulness; we still hope to be able to continue the Society.

Your's faithfully,

THOS. J. SMITH, *Assistant Surgeon,*
Secretary.

Bangalore, January 22, 1839.

At a Meeting of the Subscribers held at the Public Rooms, Bangalore, on Wednesday, 9th January, 1839.

Major General Sir Hugh Gough, K. C. B. in the Chair.

It was Resolved,—That in consequence of a great part of the members of the Committee, including the Treasurer and Secretary, having left or being about to leave the station, the following gentlemen be requested to form the Committee for the year commencing on the 1st January, 1839.

Brigadier Burton,

Captain McCally,

Major Montgomerie, C. B.

,, Cunningham,

,, Stones,

Dr. Boyd.

,, Ley,

Captain Coffin, *Treasurer.*

Dr. Smith,

Geo. S. Gough, Esq.

} *Joint Secretaries.*

The Treasurer submitted his accounts, shewing a balance of Rupees 679-15-5 in favour of the Society to 31st December, 1838.

In consequence of the falling off in the number of members occasioned by so many having left or being about to leave the station, and the consequent low state of the funds, the Patron and Subscribers present at the Meeting, earnestly request a full meeting of the Society on Monday morning the 14th instant, at $\frac{1}{2}$ past 7 o'clock, at the Public Rooms, to form some rules consequent thereon.

Resolved,—That the Officiating Secretary be requested to give publicity to the Rules of the Society amongst the new arrivals at the station, and to request those who wish to avail themselves of the advantages of the garden, or to support so useful an institution, to send in their names as subscribers to him.

(Signed) WILLIAM MUNRO,

Officiating Secretary.

At a Meeting of the Subscribers held at the Public Rooms on Monday 14th January, 1839.

Present.—Major General Sir Hugh Gough, K. C. B., Brigadier Burton, Major Montgomerie, C. B., Captains McCally, Coffin, Bingham, Whittock, Western; Lieutenants Munro and Gabbett; Drs. Mouat, Smith and Parkison; Rev. G. Trevor, Geo. S. Gough, Esq.

Major General Sir Hugh Gough, K. C. B. in the Chair.

Captain Coffin having stated his inability to take the office of Treasurer, Captain McCally was elected, and the Rev. G. Trevor, Captain Bingham and Captain Western added as Members of the Committee.

Proposed—Brigadier Burton, *Seconded*—Major Montgomerie, C. B.

That the cordial thanks of the Society be presented to Lieutenant Munro, H. M. 39th Regiment, for his constant and assiduous exertions in the service of the Society, and this Meeting desires to record its grateful sense of the many obligations under which they are placed by the zeal displayed by him on behalf of this institution, which is mainly indebted to him both for its original formation and its subsequent and increasing prosperity.

The Meeting desires also to record its high sense of the services of their late Treasurer, Major Ley, who with Lieutenant Munro was one of its earliest supporters, and one of the warmest friends of the Society.—Carried unanimously.

Proposed—Dr. Mouat, *Seconded*—Lieutenant Munro.

That the sale of fruits and vegetables be in the first instance confined to the Members of the Society, and that the Committee be authorized to take measures if necessary for limiting the other advantages of the Society to Subscribers.—Carried unanimously.

Proposed—Rev. G. Trevor, *Seconded*—Brigadier Burton.

That in consequence of constant applications to the Secretary for gardeners from all parts of the country, the Committee be requested to make arrangements for instructing such boys as are desirous to

learn gardening and to establish a school for this purpose in the garden.—Carried unanimously.

Proposed—Captain Coffin, Seconded—Captain Whittock.

That the thanks of the Meeting be given to Major General Sir H. Gough, K. C. B. for his obliging conduct in the Chair.

THOS. J. SMITH, *Assistant Surgeon,*

Secretary

Bangalore, Jan. 22, 1839.

MARCH 13, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Rooms, Town Hall on Wednesday, the 13th March, 1839.

The Hon'ble Sir Edward Ryan, President. in the Chair.

MEMBERS ELECTED.

The following gentlemen proposed at the last Meeting were elected Members :

Honorary Member.—His Excellency the Right Honorable Stewart Mackenzie, Governor of Ceylon.

Ordinary Members.—The Hon'ble Sir Henry Seton, John Trotter, W. G. Johnson, Woolryche Whitmore Ryan, Francis Curwen Smith, Wm. Sinclair, J. W. Cragg, Allen Campbell Dunlop and T. P. B. Biscoe, Esqs. ; Captain S. W. Feuning, and Lieutenant F. C. Burnett.

MOTIONS OF WHICH NOTICE WAS GIVEN AT THE LAST MEETING.

1. *Cochineal. Claim for the Government Reward.*—The business that first came on for discussion was the consideration of the motion made at the last Meeting by G. A. Prinsep, Esq. and seconded by the President, claiming, on the part of the Society, the reward of £2,000 offered by the Court of Directors for the introduction of the live Cochineal insect of the fine species into their Indian Territories, in a fit state for propagation. Mr. Prinsep in support of his motion addressed the Meeting at some length and took a view of the doings of the Agricultural and Horticultural Society, relative to this important question from the commencement of their application to the subject. He reminded the Members of the Society that in their

endeavours to introduce successfully the fine-grained Cochineal into the East Indies, the Court of Directors had incurred a great expense at Madras, and afterwards, at the representation of the Governor in Council at that Presidency, the Court had *confirmed* a recommendation made to them to offer a reward of £2,000, or 5,000 pagodas, for the introduction of the insect upon British vessels only, "lest foreigners, so encouraged, should avail themselves by the discovery, and so diminish the value by propagating and increasing the breed of the insect."

Some years since when he was turning his thoughts to the propagation of Cochineal as a speculation of his own, Mr. Prinsep related having held an interview with Mr. Robinson, the then Chairman of the Court of Directors; and on bringing the circumstance of this offer to his notice, Mr. Robinson expressly assured him, that should he (Mr. Prinsep) obtain at Vera Cruz, or elsewhere, the true insect, and convey it to India, and succeed in making it propagate there, that he would, undoubtedly, be entitled to the reward which lay open to any person.

In reference to what the Agricultural and Horticultural Society of India had done to deserve this reward, Mr. Prinsep went into particulars relative to the condition of the *Nopalerie* of the Society, since it had fallen under his superintendence, and stated, that he had planted out specimens at Alhpore, Kidderpore, the Botanic Garden, Sook-Saugor and the Sunderbuns—so as to effect as extensive a cultivation as possible. In conclusion, Mr. Prinsep called the attention of the Society to the present commercial value of Cochineal, and exhibited on the table at the Meeting, the plant which has recently been received in this country from Mr. Anderson of the Chelsea Garden, through Dr. Royle, with the insect upon it—both of which were in a state of great vigour and promise. Of the genuineness of the insect on this plant there could be no question—as he believed, that the Cactus was received at Claremont from Vera Cruz with the insect on it. He considered, therefore, that the Society had justly earned the reward from the Government, and recommended that application be forthwith made for the sum of 20,000 rupees, which, when obtained, he would recommend, should be appropriated exclusively to the preparation of localities for the better protection of the imported insect. In Mexico and other places where the fine insect is made an object of commerce, the *Nopaleries* are formed in ravines and dells, that both the plants and insects may be protected, as much as possi-

ble, from storms. Whereas here, in Bengal, it has hitherto been the practice to allow the plants to be exposed to all the violence of tempests.—He therefore moved that the motion be carried.

The President alluded to the expected arrival of the new investment promised by M. Bedier from Bourbon, which would afford additional weight to the claim now brought forward. He suggested therefore that in the mean time the gentlemen who stand recorded as the Cochineal Committee, be requested to give the Society the benefit of their services, and that a draft of an application be prepared by them for adoption at the next General Meeting in which the particulars of the result of the former experiments shall be given, and the reward be duly laid claim to.

This proposition met with the concurrence of the whole Meeting, and was carried accordingly.

Appointment of Collector.—The President next desired to call the attention of the Society, to a notice of motion on the board recommending that the *Special* Committee of Finance be made a *Standing* Committee, and that the Assistant Secretary be appointed Collector under them on a salary of 50 rupees a month, in addition to his present income of 150 rupees. This was carried unanimously.

NOTICE OF MOTIONS FOR DISCUSSION AT THE NEXT MEETING.

No. 1. Proposed by Mr. Piddington—"That the Secretary be authorized to incur the small expense necessary to provide for the formation of a Cabinet of Soils."

No. 2. Proposed by Mr. W. P. Grant—"That the Society restrict the prizes offered for bulls in the current year, to bulls of the Devonshire breed."

FOR ELECTION.

The names of the following gentlemen were read as candidates for election at the next Meeting: Chas. Cardew, Esq., C. S.—proposed by Mr. Robert Watt, seconded by Dr. Spry.

John Hughes, Esq.—proposed by Mr. W. F. Gibbon, seconded by Dr. Spry.

Allen Webb, Esq. M. S.—proposed by Dr. Spry, seconded by Dr. Wallich.

C. J. Richards, Esq.—proposed by Mr. John Richards, seconded by Mr. R. J. Bagshaw.

Lieutenant Jas. Wemyss, (44th Regt. N. I.,) Junior Assistant Agent, Governor General on the N. E. Frontier—proposed by Captain J. Mathie, seconded by Dr. Wallich.

Arthur Smelt, Esq., C. S.—proposed by Colonel McLeod, seconded by Dr. Spry.

W. H. Elliott, Esq., C. S.—proposed by Mr. A. Beattie, seconded by Dr. Wallich.

LIBRARY.

The Secretary brought forward a copy of Loudon's *Arboretum et Fruticetum Britannicum*, or the Trees and Shrubs of Britain, 8 vols. octavo, which he proposed to purchase for the Society's use.

MUSEUM.

1. A chest containing about one hundred pounds of Egyptian Cotton Seed, and

2. Two bags (about two bushels) of Malta Cotton Seed, which produces a *red description of Wool, and the colour of which never fades*. Presented by G. U. Adam, Esq.

(*Note*.—Members and others desirous of being furnished with portions of these seeds can be supplied on application at the Society's Rooms.)

3. A second specimen of Cotton, grown from Seychelles' seed at Hidgellee. Presented by Dr. Smith, Civil Surgeon.

The staple of this Cotton like the former presented by Dr. Smith, was pronounced particularly good.

4. A case of Tapioca grown and manufactured at Allipore, by Mr. Speed, who mentions that he believes himself *to be the first person who has succeeded in getting up this article, and that it has been tested by Professor O'Shaughnessy, who describes it "in every respect equal, and in some superior to Brazilian and London specimens."*

5. Varieties of Soil, chiefly in which Cotton has been grown, from the Mauritius, Singapore, Bundelkund and America. Presented by Mr. Piddington.

6. Seeds from the Peruvian Cotton Plant, reared near Sook-Saugor, and also specimens of the Cotton from the same. Presented by G. A. Prinsep, Esq.

For the whole of the foregoing contributions the thanks of the Society were given.

PURCHASE OF INDIGENOUS COTTON SEEDS.

The Report of the Cotton Committee recommending the appropriation of 500 rupees for the purchase of the best kinds of Indigenous Seeds, was next read and passed. (See Appendix.)

AGRICULTURAL STATISTICS.

The Secretary brought forward the reply of Government to the letter which was addressed by him to the Chief Secretary in accordance with the resolution of the Society at the last Meeting.

No. 233.

To H. H. SPRY, ESQ., M. D.

Secretary to the Agricultural Society.

SIR,

I am directed to acknowledge the receipt of your letter, dated the 15th instant, requesting that permission may be granted to you to receive and transmit free of postage all letters and documents, containing information relative to prices, &c. of Agricultural products of India.

In reply I am directed to state that, it does not seem to his Honor the President in Council to be necessary to make any alteration in the existing rules, under which the correspondence of Societies, if relating to public objects, can be transmitted through this office.

I am, &c.

(Signed)

H. T. PRINSEP,

Secy. to the Govt. of India.

Council Chamber, Feb. 20th, 1839.

REPORT FROM GLASGOW ON ASSAM TEA.

Mr. Dearie favored the Society with an extract of a letter, dated December 12th, received from Mr. W. P. Paton, of Glasgow, to the address of Messrs. Eglinton, McClure and Co. of this city, respecting the Assam Tea sent home last May, from which it will be

observed that the brokers and tea-dealers in Scotland speak very favorably of it ;—

“ Provost Dunlop has given me to-day a small canister of Assam Tea sent to him by the *India Board*, to have a report upon it, and I have given it to Mr. Connal for that purpose. It appears a most useful description of tea, and may become an article of great national importance”—and from ditto, dated 19th December, 1838, “ The Tea-dealers and brokers here report very favorably of the quality of the Assam Tea ; it is good and strong, and would be very saleable here : it is worth about 2s. per lb.”

The President remarked on the great importance of this communication and alluded to the fact, that hitherto no communications connected with the Proceedings of the Tea Committee had ever been communicated by the Government to the Agricultural Society. In the success of the enterprise all took an interest, and he recommended, that the Secretary be directed to apply to Government in the General Department for a copy of the Report and Proceedings of the Tea Committee, that the same might be made public.

Dr. Wallich said, he thought the Committee would, as a wish to the effect was expressed by the Society, readily furnish their papers on the subject, and undertook to bring the desire of the Society, to the notice of the other Members of the Tea Committee.

CAPABILITIES OF THE SOIL OF GUZERAT FOR THE PRODUCTION OF SUPERIOR COTTON.

Mr. Ewart favored the Society with a highly interesting extract of a letter, which he had received from his brother at Bombay, who has been largely engaged in Cotton-spinning at Manchester. “ Dr. Burnes, at Kaira, has 50 or 60 trees of Bourbon Cotton, three years old, some of the produce of which he showed me. It is excellent Cotton, quite equal to the best New Orleans’ Cotton. The seed from which these trees are grown, was taken from trees which he found growing wild, part of which were planted in that country 15 years ago by Mr. Gilder. The seed does not seem to have been deteriorated,—it is black and smooth, not like the Indian seed, to which the Cotton adheres so firmly.”

Mr. Ewart adds—“ My brother does not say what soil these plants are grown in, but I will ask him. It is curious, that such

plants should have been neglected so long as 15 years—but it is only another proof of indolence and carelessness !”

The Secretary mentioned in connection with the foregoing intelligence, that he had discovered among the papers lately published by the Court of Directors on Cotton-Wool, Raw Silk and Indigo,—the original report of the Bombay Government made in the year 1818, touching the plantation of Mr. Gilder, Civil Surgeon, and adverted to by Mr. Ewart in his communication, and of which he submitted the following paragraphs :

“ Mr. Gilder very judiciously selected a spot for his late experiment in the eastern districts, between the Suburmatty and the Myhee, where the greater portion of the soil is of a light sandy nature, as recommended by the cultivators in the Island of Bourbon, and where the general division of the country into enclosures protects the plants materially from the influence of the hot winds and from the ravages of cattle, which appear to be an almost insuperable objection to the cultivation of this shrub in the open country about Broach.

“ The Cotton produced from twenty-seven beegahs amounts to about $44\frac{1}{2}$ maunds of clean Cotton, and on examination at the Presidency has been reported by the Native Merchants, to be of excellent quality ; that is, very much superior to the first and second thomil, and well adapted to the Europe market.

“ The greater portion of the soil between the Suburmatty and the Myhee is of the light sandy nature recommended by the cultivators of the Island of Bourbon, and the general division of the country into enclosures, protects the plant materially from the influence of the hot winds, which are considerably milder than on the plains to the westward. The facility, also, which this division presented for irrigation, if necessary, was an object of the greatest importance.

“ Admitting the climate and soil of this part of Guzerat to be favourable to its cultivation, it has a decided advantage over the Island of Bourbon, in not being liable to those changes to which the climate of all Islands, and more particularly mountainous ones, is subject. For instance, in Bourbon, when the cultivator expects to reap the fruit of his labours, a sudden and heavy fall of rain takes place when the Cotton is ripe for gathering, and nearly destroys the whole.

“ The spot selected for the trial was chosen from its local convenience for superintendence ; the soil a sandy loam, the general

character throughout these districts. It afforded the means of irrigation, but these were not availed of, as it appeared desirable to ascertain the product of the soil without such assistance, which would have added very materially to the expense of cultivation, independent of the difference of rent of the land, which, if possessing means of irrigation, averages ten rupees per beegah; if not, four rupees per beegah is a fair estimate. The seed was sown in rows, distant three feet from each other, preserving the same distance of plants in each row. The sowing commenced at the end of July 1816, after the first heavy rains were over. Bejaree was sown by drill, in the usual manner, at the same time with the Cotton. The sowing of Indian Corn with the Cotton is recommended at the Isles of France and Bourbon, as affording protection to the tender plants from the heat of the sun until the grain be ripe, by which time they have acquired sufficient vigour. In the present case the Bejaree answered the purpose equally well; and as the plant yields no return the first season, the crops of Bejaree ought to pay the expense of rent and cultivation.

“The after rains of 1816 were very scanty, and the plants remained in an apparently sickly and dwindled state until the rains of 1817, when they put forth most luxuriantly; so much so, that it was found necessary to remove every alternate plant, which left a space of six feet between each: still they were subsequently too crowded. I think eight feet would be a good distance. The flowering commenced early in September, and the Cotton began to ripen in November. The gathering of the first crop was finished by the middle of January: a second crop may be expected in the month of May, but I imagine a very scanty one. Opinions are divided on the Island of Bourbon, whether the plant should then be cut down or simply left to the operation of nature. The preference can only be decided by experience, and I would of course recommend that one-half of the plantation be pruned, leaving the other to its natural state.

“There are two kinds of cotton cultivated in Bourbon; one producing a black seed, which is very easily detached from the cotton; the other a *white*, adhering so firmly to the staple, that the latter is torn from it, leaving the ends of its fibres in the seed, which gives it the white appearance. No sample of the white seed has been hitherto received. The culture of cotton has been introduced in the Islands of Bourbon and Mauritius within the last thirty years. It

would be desirable to know from whence the seed was originally imported : in all probability it came from some of the French West India Islands. It is not unreasonable to infer, that the Pernambuco, Sea Islands, and other superior descriptions of cotton, might be successfully cultivated in this Province. The object appears to merit a trial, which experience proves may be done at a very trifling expense.

“ The culture is equally simple with that of the common cotton of the country.”

The information now communicated therefore of the superiority of the Cotton grown in these districts, after a trial of so many years, is a very encouraging stimulus to the Cotton-growers in India, and proves that good sites are all that they require to command success.



AGRICULTURAL PROSPECTS IN AZIMGHUR.

The Secretary (Mr. H. C. Tucker) of the Branch Society at Azimghur, reports the following gratifying intelligence from his division to the Parent Institution :—

“ I have the honor to inform you that the medal and prize for the best Otaheite Sugar-cane was won by Mr. H. E. Hunter, an Indigo planter and zumeendar of this district.

“ The prizes distributed were as follows :—

“ Best Otaheite Sugar-canes, (Medal to be given when received from Calcutta,)	10 Rs.
“ Ditto Potatoes,	10 „
„ Carrots,	10 „
„ Celery,	10 „
„ Turnips,	5 „
„ Cauliflowers,	5 „

Total, . . 50 Rs.

“ The rewards were distributed in a meeting of about 14 Europeans, and upwards of 3,000 of the most respectable Natives in the district, who had been assembled to witness the investiture of a khillut of 1,300 Rs. given to a Tuhseeldar by Government for the suppression of infanticide, and also to examine the Government School of the station. The competitors' Sugar-canes, after astonishing the natives by their size, (the top-leaves reaching the top of the canopy nearly 14 feet high) were distributed to them for eating ; and the taste then

bestowed, has given the strongest impulse to the diffusion of the Cane throughout the neighbourhood. The Cane thrives well here; and this year nearly 1000 Canes have been distributed to various individuals interested in its cultivation. We are trying the planting of the Canes in *October*, instead of *March**. The Canes planted in *October* escaped nearly entirely the ravages of the white ants and insects, which usually destroy half the seed Cane when placed in the ground in *March*; and should the Canes ripen before the rains, so as to yield good sugar, the benefit will be incalculable—even if they only afford the natives a pleasant food and sherbet at the end of the hot weather, the experiment will not have been useless. I purpose letting you know the state of these Canes in *June*: at present they look most flourishing; and though planted too late, are already about two feet high.

“ We have within the last six weeks obtained three new subscribers to our Society—which is in a flourishing condition—10 beegahs are being added to the garden, to be laid out as a nursery to supply the district with Otaheite Cane, Egyptian and other Cotton, Guinea Grass, Maldah Mangoes, &c. The few pods of Egyptian Cotton which have ripened, have been much approved by all the natives who have seen and felt them; the Cotton being much greater in quantity, very soft and silky, and easily separated from the stone. Guinea Grass is a product which will be especially valuable in this district, where the jungles are all being rapidly cut down, and the land brought into cultivation. Without the introduction of this and other artificial grasses, great difficulty will be, and is even now, experienced, in providing the numerous cattle with provender. The natives have a prejudice against turnips, although they plant and consume potatoes to a considerable amount. Mangel Wurzel, should it succeed, will be very useful. I am anxious to encourage the Vine, which ought to flourish in a light sandy soil like this—the Vines in the Horticultural Garden are very good ones—and I have had a number of kullums taken this year, with a view to their diffusion over the district. A couple of Vines planted by the hut of the poorest peasant, would furnish him with a delicious luxury in the hot weather; and the common complaint of grapes not ripening sufficiently, would very probably be removed by the heat of the cottage roof—it shall at any rate

* Lieut. Kirke in the *Dhoon* has practised this plan with great success.—H. H. S.

be tried. The Tobacco had not a fair trial this year, so that I am unable to judge of the result."

HOOGHLY BRANCH SOCIETY.

A Report from Dr. Wise was next read, communicating the particulars of the disbursements of the Society's prizes at Hooghly on the 9th February :

"The exhibition of Vegetables took place in the Zumindaree School House at Hooghly, and was attended by the principal residents of the station and a large concourse of Native gentlemen.

"The display of Vegetables was very respectable ; and the following prizes were awarded :

"1. Ram Chunder mallee, received the first prize of a silver medal and five rupees for the best Potatoes reared in the neighbourhood of Harripaul*.

"2. Hurrey mallee, received the second silver medal and five rupees for the best specimens of Nolcole, Turnips, Indian Corn, Cabbages, and Arrow-root.

"3. Budden mallee, received two rupees for the best specimen of Cauliflower.

"4. Gobindas mallee, for very fine Cabbages and Peas, received three rupees.

"5. Hurmee mallee, for some fine Turnips and an enormous Pumpkin, two Rupees.

"6. Gomes mallee, for fine Cabbages and Nolcole, two rupees.

"7. Pruno mallee, for fine Potatoes, two rupees ; and,

"8. Goluck mallee, for fine Lettuces and Radishes, two rupees."

GARDENING AND CANE PLANTING AT THE MAURITIUS.

Mr. Hugon in a letter from the Mauritius to the Agricultural Society of India, states that "Gardening here is carried on on a large scale by Europeans. I saw one estate which yields 8,000 dollars entirely by the sale of vegetables." * * * * * "Whatever be the quality of the soil, the depth at which natives plant the Cane in India is uniform,—here it varies very much even in the same planta-

* Many hundreds of beegahs of land are in potatoe cultivation in the Collectorate of Hooghly.—H. H. S.

tion. I think the first steps in improvement should be in the mode of planting, and that attention should be directed to that point as much as to the introduction of the Otaheite Cane."

CAOUTCHOUC.

Dr. Wallich communicated the award made by the London Caoutchouc Company to Captain Vetch for his zeal and industry in promoting the manufacture of Caoutchouc in Assam :

"The Board regret that the samples received are not prepared in such manner as to allow their awarding to you the premium of one hundred guineas, but in conveying their cordial thanks for what has been sent, and to testify their feelings for your promptitude in promoting that which, from the largely increasing consumption of Rubber, cannot fail to be a most important branch of export from the East Indies,—I am directed to inform you that the Board have, with great pleasure and satisfaction, voted the sum of twenty-five guineas, as an acknowledgment to you, the disposal of which in any agreeable and appropriate form, has been left to the arrangement of Dr. Royle and your brother Captain Vetch, R. E., with whom this matter now rests, and from whom you will no doubt shortly hear.

"With respect to the value of the Rubber, which from its not being allowed sufficiently to dry, was found on its arrival here to be in mass, the Board have considered that the full market price should be allowed, and the amount therefore, viz.—2 cwt. 1 qr. at ls. per lb. =£12 : 12, is placed to your credit, and which will be paid to any person you may appoint to receive it. The value, if sent as directed, would have been at present market price 2s. per lb.

"The Board desire me to express their hopes, that the success which has, in so short a time attended your efforts, will induce you still further to apply yourself to its more perfect preparation, and in encouraging this branch of trade in an article hitherto of no avail in the districts of our Eastern possessions, fully bear out the opinions which have been so confidently expressed by Dr. Royle,—that the production of so important a staple of commerce in our settlements, was not merely possible, but certain, if necessary attention was directed to its collection."

The Secretary called the attention of the Meeting to a letter which he had received from Mr. Payter, at Jeypore Factory, in the Collecto-

rate of Dinagepore, intimating the loss of nearly all his investment of Sugar-Canes from the circumstance of their being packed in *paddy* straw instead of with the *birna* or *ooloo* grass. The Society were pleased to resolve, that Mr. Payter should be furnished next year with a supply gratuitously to compensate for his loss.

HENRY H. SPRY, *M. D.*

Secretary.

APPENDIX.

REPORT OF THE COTTON COMMITTEE.

The Cotton Committee having taken into consideration the reference made to them at the last meeting, to determine the amount that should be allowed for the purchase of supplies of Indian Cotton Seeds,—beg to recommend that one hundred rupees be appropriated for the purchase of Dacca, of Surat, of Tinnevely, of Salem, and of Nellore Cotton seed, making a total of five hundred rupees.

G. A. PRINSEP.

G. U. ADAM.

D. B. SYERS.

W. EARLE.

WM. KERR EWART.

WM. STORM.

CHARLES HUFFNAGLE.

HENRY H. SPRY, *M. D.*

Secretary.

Calcutta, February 26, 1839.

APRIL 10, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Rooms, Town Hall, on Wednesday, the 10th April, 1839.

The Hon'ble Sir E. Ryan, President, in the Chair.

The Proceedings of the last Meeting were read and confirmed.

MEMBERS ELECTED.

The following Gentlemen proposed at the last Meeting were elected Members :

Charles Cardew, John Hughes, Allen Webb, C. J. Richards, Arthur Smelt, and W. H. Elliott, Esqrs., and Lieut. James Wemyss.

MOTIONS OF WHICH NOTICE WAS GIVEN AT THE
LAST MEETING.

The Motion, No. 1, which stood for discussion, was one by Mr. Piddington, "That the Secretary be authorised to incur the small expense necessary to provide for the formation of a cabinet of soils"—was carried.

Motion, No. 2, by Mr. W. P. Grant, that the Society restrict the prizes offered for bulls in the current year, to bulls of the Devonshire breed, was lost.

The names of the following Gentlemen were read, as candidates for election at the next General Meeting :

W. S. Hudson, Esq. (Deputy Collector at Mymunsing), proposed by Dr. Spry, seconded by Mr. Storm.

W. C. Braddon, Junr. Esq., (Firm of Bagshaw and Co.) proposed by Dr. Spry, seconded by Dr. Wallich.

Geo. Hill, Esq., proposed by Dr. Spry, seconded by Mr. Storm.

J. C. Kiernan, Esq., proposed by Mr. G. F. Speed, seconded by Mr. Storm.

The President called attention to the Report of the Cattle Committee, which was then read. (*Vide Appendix.*)

Approaching Exhibition of Horticultural Prize Fruits.

The Secretary next submitted a schedule of prizes for the best fruits to be exhibited at a show which is fixed to take place early next month (May), of which due notice will be given.

LIBRARY.

A copy (No. 9) of the Journal of the Royal Asiatic Society of Great Britain and Ireland, was presented on the part of the Society.

MUSEUM.

Horticultural and Floricultural Department.

1.—A basket of five Apples, weighing collectively 29 ounces, from the garden of Mr. Finch, at Shahpore Oondee, in Tirhoot, presented by Mr. Finch.

2.—A basket of two Pears, grown in the garden of Mr. Charles Steer, at Kishnagur.

The above fruits were much admired for their beauty and flavour.

3.—A fine specimen of Beet Root, grown in the garden of Mr. Barlow, at Hidgcllee, with a memorandum of the mode of preparation, drawn up by that gentleman, presented by Dr. Smith, on behalf of Mr. Barlow.

4.—A bag containing 32 lbs. Lucerne Seed, presented by Colonel C. C. Smyth, of the Cavalry.

5 & 6.—Two packets of the celebrated Prangos Seed, of Moorcroft, and a small packet of Melon Seed, from Iskardoh, forwarded by Dr. Falconer, from Thibet and Cashmere.

7.—A parcel containing five pieces of manufactured Mazunguree Silk, and a specimen of the plant (*Adhakoree Tetrathera*), on which the worm (*Phalæna Cynthia*?) thrives, presented by Dr. Wallich on the part of Captain Jenkins.

8 & 9.—Two parcels of mixed Dahlia Seeds, from Lieut. Kirke, and another containing *Oenothera Mutabilis*—from the same officer—all from the valley of the Dhoon.

10 & 11.—Four plants of the tree yielding the fine black varnish called Theet-tsee, (*Melanarrhæa usitata*, Wall.) and two plants of a

very pretty flower, *Clorodendron Squamatum*,—presented by Captain Macfarquhar at Tavoy.

These plants had just been landed from the Ganges Steamer. The varnish plants were dead, but the flower plants were alive and transferred to the nursery.

12.—A box containing four fine Mango Trees, commonly known as the Bombay Mango, presented by Captain Talbot at Bareilly. *Made over to the nursery.*

13.—A specimen of cotton grown in the Mymensingh Districts, presented by Mr. Hudson, Deputy Collector.

The cotton was very short in staple and pronounced to be of a very inferior quality.

14.—A specimen of Wood of the Dammer Tree,—presented by F. P. Strong, Esq.

ASSAM TEA.—*Despatch of the Court of Directors to the Bengal Government.*

The subject which next engaged the attention of the Meeting was the despatch from the Court of Directors, which had been placed at the disposal of the Agricultural Society by the Bengal Tea Committee, regarding the cultivation and quality of the Teas grown in the Province of Assam, forwarded from this country in February last year.

REVENUE DEPARTMENT.—No. 12 of 1838.

Our Governor General of India in Council.

1. We now reply to Paras. 49 to 52 of your letter dated the 12th March, 1838, together with the letters and paras. noted

* 30th Jan., 1837, Paras. 18 to 29. on the margin*, in which you
 3rd April, 1837, „ 11 to 20.
 4th Sept, 1837, „ 29 to 34. bring under our consideration
 20th Oct., 1837, „ 38 to 43. your further proceeding respect-
 12th Feb., 1838, (whole) No. 5.
 26th Do., 1838, (do.) „ 6. ing the cultivation of Tea in
 Upper Assam.

2. The knowledge attained by Mr. Bruce, the Superintendent of Tea Culture, with respect to the proper mode of manufacturing the Tea, and the further discoveries made by him and others of the existence of extensive plantations, especially with reference to the fact that the genuine Green Tea plant of China is indigenous to the

Singfoo Country, is highly important and very satisfactory, and we approve of your having authorized the Tea Committee to procure persons from China, acquainted with the peculiar process of Green Tea manufacture. We have forwarded to the Royal Asiatic Society, copies of the printed report by Mr. Bruce, received with your letter of the 26th February, 1838, and have otherwise circulated the tract as suggested by you.

3. We submitted the samples of Tea received with your letter dated the 12th February, 1838, to several Houses of the first character in the London trade, and also to Mr. John Reeves, formerly the East India Company's Tea Inspector in Canton; and, from the replies received, we are enabled to furnish you with the following opinions and observations thereon. First crops Muttuck Teas forwarded by the Tea Committee under date the 12th December, 1837, and marked

(A) Souchong No. 1, Majoo Gohynes, shady tract.

(B) Do. No. 1, Chubwa, sunny ditto.

(C) Souchong No. 1, Deenjoy, ditto.

(D) Paho No. 3, Tingri, shady ditto.

(A) "This Tea is somewhat similar in appearance to the Tea denominated Hung Macy; it has some well made and well twisted leaf, but is too unequal in size from the mixture of large leaves."

(B) "Is a differently made Tea more approaching to Congou, or Souchong Congou kind; it has a dull brownish and rather broken leaf mixed with pale leaves; these latter should be picked out, and

* This sample appears the worst of the four, but the quantity is too small to form a correct opinion. then it might be called *Congou**; a brighter black and more perfect leaf is desirable."

(C) "Is a somewhat similar Tea, but better of the kind; has a good proportion of *well* made and well twisted leaf in it, but a proportion also of pale leaves which should be picked out." "The leaf is too brown, but it is larger and better made than B."

(D) "This, though called Pekoe, is similar to A; the leaf too large, unequal, and brown for Pekoe Tea; the ends of the smaller leaves (the Pekoe) are of a yellow cast instead of white, but there is in this a good proportion of well made leaf. The downy ends are too short; the flavour is light and pleasant, but the strength of A is wanting. The leaves of all the above (A, B, C, and D,) shew after infusion that they are good and young; those of A and D appear like Pekoe, and of B and C like good Congou."

plantation," and this circumstance may account for some of the remarks introduced by Mr. Reeves.

13. We observe, however, that you have, to a certain extent, provided for this; but, although we do not hesitate to sanction the expense incurred on this account, as well as the addition to the salary of Mr. Bruce and other pecuniary arrangements hitherto reported to us, it must be borne in mind that the establishment must not be increased beyond what is absolutely necessary to bring the trial to a fair practical issue; which, when generally known, the speculation will doubtless be taken up with avidity by the Commercial Capitalist.

14. We are informed that the cultivation and manufacture of Tea has of late years been very much attended to in Java, and that the produce is sent to the Netherlands, where it finds a ready market.

15. We are aware that in the former reports received from you on this subject, allusion was made by Mr. Gordon, to the fact that Tea was grown and manufactured in Java, South America, St. Helena, &c.; but that it had been looked upon as a failure, owing to the want of a proper altitude above the sea and other requisites which are found in the district of Assam.

16. We are led to believe, however, that good samples of Tea are exported from Java, the leaves of which are well twisted, and closely resemble the Tea received in this country from Canton, and that the flavours are pronounced by the trade to be for the most part "good to fine."

17. It may therefore not be unworthy of inquiring how far the mode of manufacture in Java assimilates with that pursued at Assam or in China.

18. With respect to the packing and the particular description of Tea most likely to suit the London Market, considering the importance of the subject, we have deemed it advisable to transmit to you by the ships named in the margin, two quarter chests of the best

* This Tea is still made by Howqua, but of an inferior quality.

chops made by Howqua for the East India Company*, namely, one of Ee Hop and one of Ee Fat. These will guide the manufacturers in Assam, as to the size and colour of the leaf, and the best and most approved mode of packing.

19. When you find yourselves in a condition to do so, you will ship six quarter chests of Tea approaching as nearly the description of the chests now sent to you as practicable and similarly packed, and you will consign them to Mr. William James Thompson, of Dunster

Court, Mincing Lane, to whom we shall give directions to offer them to the Trade. Previously to which however, or simultaneously with it, you will send to us, as a number in the Packet, not less than a quarter chest of the same Tea, in order that we may test the same before we permit any of it to be offered for sale.

20. We are disposed to concur with you in opinion, that the prospect of introducing Tea into this country, grown and manufactured in our own territories, is highly encouraging, and we may hope that, with due attention and perseverance, the objects contemplated by us in the first view we took of the subject may without much apprehension, be considered as in a fair way of attainment.

21. We desire that you will communicate to the Tea Committee, to Mr. Bruce, to Mr. McClelland, and Dr. Griffiths, our approbation of the zeal and ability they have evinced, the former in the conduct of this experiment, generally, and the three gentlemen above named in particular for the able reports they have respectively furnished on the subject.

We are,

Your affectionate Friends,

(Signed) J. L. LUSHINGTON.
R. JENKINS.
H. SHANK.
J. PETTY MUSPRATT.
JOHN SHEPHERD.
J. WARDEN.
JOHN MASTERMAN.
WM. YOUNG.
HY. ST. G. TUCKER.
HY. ALEXANDER.
T. THIORNHILL.
GEORGE LYALL,
JOHN COTTON.

London, 26th September, 1838.

The attention which is now engaging the minds of Commercial Capitalists on the subject of this new speculation makes it desirable, in the opinion of the Society, that the utmost publicity should be given to the measures in course of adoption for establishing this lucrative and inviting culture, and in returning the thanks of the Meeting to the Tea Committee for their communication, the Secretary was fur-

ther requested to solicit copies of minutes of proceedings which the Committee themselves have adopted up to the present time, as the Secretary of the Committee had intimated "that he should be most happy to communicate to the Society, copies of such other interesting documents as they may receive connected with the Tea culture in this country."

Establishment of a Public Garden at Secundra, near Agra.

A communication from the Commissioner at Agra was read, intimating that a Public Garden had been formed at Secundra, and placed under the care of Mr. Kaine, formerly of the Saharanpoor Establishment. The area at Secundra is described to contain excellent soil, with good water, and promises to be a most advantageous nursery for the supply of the country round. The Commissioner's application to have seeds sent to him, had been, the Secretary mentioned, complied with, and a large assortment of every kind in the Society's Museum despatched to the address of the Superintendent of the Public Gardens by the last Steamer.

Prangos and Melon Seeds from Thibet and Cashmere.

Dr. Falconer in a highly interesting despatch to the Secretary, communicates the despatch by dāk of a small packet containing melon seeds from Iskardoh, and some excellent seeds of the Prangos Pabularia or Prangos grass of Moorcroft, collected by Dr. Falconer, in his recent tour through the valley of Cashmere and Thibet. The melons are described to be of an excellent quality and have a most delicious flavour, like Bokhara and Yarkund, they enjoy a high reputation throughout the neighbouring countries. The Prangos Pabularia Dr. Falconer found growing extensively around the valley in Cashmere, occupying the sloping sides of hills, also in vast abundance in the valley of Goress upon the Kishna Gunga between Cashmere and Thibet, and in the country of Hussoorah or Astore, which occupies the eastern side of the Indus opposite Ghilgit. He says that it is every where known by the name of Prangos, and its celebrity in these countries is chiefly owing to the search which has been made after it by Europeans. Neither in Cashmere nor in Goress, nor in Iskardoh, nor at any point where Dr. Falconer came upon it could he find out that it was collected as a winter forage for cattle or sheep.

In Cashmere the Affghans are said in certain seasons of the year, to feed their horses on it for a short time as part of a course of

training, but if the seeds happen to be given to any extent they lead to blindness.

Dr. Falconer did not visit Droz, where Moorcroft chiefly collected it, (vide vol. 1, Transactions of the Agricultural and Horticultural Society of India,) but he gathered all the information he could regarding it, and in that part of Thibet, Dr. Falconer pronounces the Prangos plant a most valuable production.

The reconciliation of Dr. Falconer's experience with the observations of the lamented Moorcroft appears to be thus—"the country about Droz is exceedingly bare and bleak, in the expressive phrase used to me in describing it—*sokhteh—sunglah—a burnt up tract of rocks*—and the sides of the hills leave very little grass or other herbage convertible into fodder, but are sheeted over with the Prangos and a species of *Artemesia*, and the Thibetians, in the absence of other herbage, are compelled to collect these plants, which nature, with a kind provision, has endowed to a considerable extent with nutritious qualities. But in the other parts of Thibet, where I went, as at Gores and Astor, there is great abundance of the grasses and other rich herbage; and the Prangos, although also in abundance, is neglected. The same is the case in Cashmere." With regard to its prophylactic virtues against rot in sheep, as described by Moorcroft, Dr. Falconer was unable to obtain any satisfactory proof.

Dr. Falconer in conclusion of his valuable communication mentions his intention of forwarding a collection of fruit trees from the public gardens at Saharunpore for the Society.

Further illustration of the Resources of Assam.

On behalf of Captain Jenkins, Dr. Wallich presented to the Society a very valuable communication from that officer, consisting of an original paper with an English translation annexed, together with five pieces of the Mezangurree silk to which the paper relates. Also two specimens of the *Adakhorce Tetraonera*, on which the worm producing this sort of silk feeds.

This variety of silk manufacture is highly esteemed by the Assamese gentlemen, and the native Member of the Society, who furnishes the account, states that the produce from 1000 cocoons is generally estimated at 20 tolahs of silk (nearly half pound), and the price which the silk fetches is from 6 to 8 rupees a seer.

Darjeling.

Colonel Lloyd, in a letter to the Secretary, states that Cotton is largely cultivated by the hill people in Sekim, and by the Meehees, who inhabit the forest at the foot of the Mountains, but that the plant is of a very inferior description. In consequence of this, Colonel Lloyd applies for seeds of different descriptions for introduction into these States. The Secretary stated that he had complied with Colonel Lloyd's requisition and forwarded to him an extensive assortment of Cotton seeds.

For the various presents and communications, offered on this occasion, the thanks of the Society were given to their respective Donors.

HENRY H. SPRY, *M. D.*,

Secretary.

APPENDIX.

REPORT OF THE CATTLE COMMITTEE.

The primary object contemplated by the institution of the Cattle Committee is "to improve the breed of Cattle in India." This *improvement* consists, mainly in an endeavour to raise the fattening qualities of the indigenous bullock as well as to obtain a greater abundance of milk.

The indigenous breed of India excel in beauty of symmetry and the possession of great capabilities for draught, besides the valuable quality of a ready adaptation to a rough and scanty fare.

The terms of the Resolution require your Committee to specify the description of the animals they may deem best calculated for their purpose. To set about the work in safety it is necessary to take the experience of cattle breeding in England for a guide, as it is in that country that the greatest attention has hitherto been paid to the *art* of breeding. There, experience has shown that the reasonableness of assumed notions have not in all cases been borne out,—indeed there is no fact more certainly ascertained than this, that crossing a breed even with a better one does not necessarily improve it, on the contrary, great mischief has been done by injudicious crossing.

With this experience for their guide, your Committee are desirous of exercising the utmost caution in their mode of procedure in encouraging the importation of foreign breeds.

While your Committee therefore are desirous of avoiding any charge of partiality towards the countries whence they wish to derive

Cattle, and, in a Catholic spirit, have laid the exhibition open to Africa, America, Europe and Australia, yet it must not be concealed that the well known merits of the English breeds induce your Committee to lean with a favorable bias towards that quarter.

The extraordinary qualities of the Short Horns, would at first point to this class of Cattle as the one of all others best calculated for your Committee's purpose, but this breed, from physical causes, could not probably be maintained in this country ; nor perhaps in the present low state of Agricultural husbandry is it desirable. The same objection might apply to the Long Horns. The Polled Cattle are hardy and good, but butchers object to their meat.

The next class Cattle that we look to is the middle horn breed, and here your Committee think a reasonable hope may be entertained of finding those qualities most likely to supply the deficiencies in the indigenous breeds ;—*the grand secret of breeding being, to suit the breed to the soil and climate.*

Where the ground is not too heavy the Devonshire Oxen are unrivalled at the plough, and the climate is the mildest in England. They have a quickness of action which no other breed can equal, and which very few horses exceed. During harvest time, and in *catching weather*, they are sometimes trotted along with the empty waggons at the rate of six miles an hour, a degree of speed which no other English Ox but the Devon has been able to stand. They possess moreover great docility of temper and also stoutness and honesty for work. Their next quality is their disposition to fatten, and in this respect very few rival them, they do not indeed attain the great weight of some breeds, but, in a given time, they acquire more flesh, and *with less consumption of food*, and the flesh is beautiful in its kind ;—it is of that mottled, marbled character so pleasing to the eye as well as to the taste. Some very satisfactory experiments have been made on this point.

Here then your Committee think they possess a quality much wanted in this country, for although no beef can be better tasted than that of the small (Guance) bullocks of India, yet your Committee have reason to believe that they are by no means economical Beeves to fatten.

Your Committee are thus explicit and somewhat prolix in this, their Report, in order to explain to those who have not yet given the subject much attention, why it is, your Committee desire to encourage the importation of Cattle from England.

Your Committee have purposely abstained from allotting prizes

for imported Cows, in as much as the improvement of the *indigenous* breed is the object sought, and not the introduction of an entire new class ;—this can only be effected by the constant influx of bulls, and to this point your Committee have confined their attention in the Cattle Department.

The money prizes allotted may appear at first large, but your Committee have been led to fix these sums in consequence of the heavy demand made as “passage money” for bulls, and think sufficient encouragement would not be held out unless they dealt thus liberally.

For the same reasons that your Committee have excluded the appropriation of prizes to imported Cows, do they exclude Merino Ewes, and beg therefore now to submit for the Society’s consideration their Schedule of prizes for the year 1839 ; which if approved of, they beg to recommend should be advertized in the London Times Newspaper, for the information of those persons, residing in England, who may take an interest in promoting the Agricultural husbandry of India, that copies be also sent to the Royal Asiatic Society of Great Britain and Ireland, and to Capt. Grindlay’s East India Rooms, St. Martin’s Place, and that it be also advertized in the Indian Newspapers.

(Signed) WM. STORM.
WM. F. GIBBON.
CHARLES HUFFNAGLE.
C. R. PRINSEP.
W. P. GRANT.
NATH. ALEXANDER.

Schedule of Prizes for Cattle of various kinds to be exhibited at the annual show on the 1st February, 1840.

IMPORTED NEAT CATTLE.

1st.—For the best imported Bull of the year 1839, not less than two years old,—a Premium of 500 Rs. and the Gold Medal.

2nd.—For the second best imported Bull of the year 1839,—not less than two years old,—a Premium of 400 Rs. and the Silver Medal.

The same for the year 1841.

NOTE.—(A Preference will be shown to the Devonshire, or Middle-horned Bull.)

PRODUCE.

3rd.—For the best produce of Imported Cattle,—a Premium of 250 Rs., and the Gold Medal.

4th.—For the second best produce of Imported Cattle,—a Premium of 200 Rs. and the Silver Medal.

5th.—For the best *Bull* Calf, of any denomination calved in 1839,—the Gold Medal.

6th.—For the best *Cow* Calf, of any denomination calved in 1839,—the Silver Medal.

SHEEP.

1st.—For the best imported Woolled Merino Ram of the year 1839,—not less than two years old,—a Premium of 200 Rs. and the Gold Medal.

2nd.—For the second best imported Woolled Merino Ram of the year 1839,—not less than two years old,—a Premium of 150 Rs. and the Silver Medal.

The same for the year 1841.

3rd.—For the best pen of Merino Ewes to the number of six,—a Premium of 100 Rs. and the Silver Medal.

4th.—For the best thorough bred Merino *Ram* Lamb, lambled in 1839,—the Gold Medal.

5th.—For the best thorough bred Merino *Ewe* Lamb, lambled in 1839,—the Silver Medal.

6th.—For the best Lamb, either Ram or Ewe, cross of a Merino Ram and an indigenous Ewe, lambled in 1839,—the small Silver Medal.

CONDITIONS.

1st.—The competition is open to stock from any part of the world.

2nd.—The Pedigree and age of the stock, so far as known, must be given.

3rd.—The Committee of the Society appointed to conduct the arrangements for the show, will appoint skilful persons to act as Judges.

4th.—The Committee reserve to themselves the right of withholding any of the above awards, should the numbers of either class brought forward be insufficient in their opinion to establish a legitimate competition, or in the opinion of the Judges from inferiority, not be deserving of a prize.

4. The samples above commented on formed enclosure No. 9 in your letter to us dated the 12th February, 1838.

Assam Ka-hung Souchong, 5. This sample, the largest sent, 2d Crop, shady tract, in canister, forwarded by Tea Committee, under date the 30th December, 1837. formed enclosure No. 15 in your letter above quoted, and is thus reported on.

“ This sample holds out a prospect of being convertible into a useful Tea. There is a large proportion of well twisted leaf in it, but, like the others, the leaf is too unequal in size, to be duly appreciated in this country: if more white leaf was left in, it *might* pass for a Pekoe Tea. It is a dull, brownish, blackish leaf, possessing good strength and good flavour though musty, but the leaf is considerably too large and ought to have a bright nearly black appearance, instead of the dullness it has.” “ The defects of this Tea are, 1st a deadness or dullness of appearance; 2dly, a great inequality in the size of the leaves, being what the Chinese would call Tachar and Son Tea; 3dly, a mixture of pale leaves. The first might probably be got rid of, and a greater brightness of leaf produced, by a longer continuance of rubbing while the Teas are being fired in the pans; the brightness of Tea in the Green Teas is thus produced. The inequality of size may be remedied by cutting down the large leaves as the Chinese do with the larger leaves of the Green Tea when they want to make *Young Hyson*, and thus bring the Tea to a more even appearance. The pale leaves must be picked out, as the Trade set themselves at present very decidedly against mixed leaf Teas.”

Assam Souchong, forwarded 6. This sample formed enclosure No. 19, in your letter before by Mr. Bruce, from Suddeya, under date the 11th Aug. 1837. quoted, and is reported to be:

“ A much inferior Tea and will only rate as low Congou, the leaf is large and coarse,”—“ uneven, dull, brownish, blackish, mixed with largish palish leaves, and has less of the well made leaf, and is more of the Congou kind. It has a little smokey smell and flavour, which probably arises from the charcoal not having burnt clear,” or “ as though it had been cured with green wood. The expanded leaf after immersion does not look so young or so good as the other samples.”

7. On the whole, we consider the samples sent very encouraging, and we have much satisfaction in being enabled to add that, although the quantity of each sort is considerably too small for the purpose of forming an accurate judgment of their relative value, we

are assured by the respectable parties to whom we submitted the samples, that Teas of this kind, if properly manufactured and packed, would be readily purchased for consumption in this country.

8. Particular care should be taken that the wood is of such a description as will not communicate any scent to the Tea; we find that the leaf of all the samples we received "possesses much substance, and though so large and full grown, yet, when expanded, appears to be young, and therefore has all the necessary qualifications for forming a useful Tea."

9. It is suggested by Mr. Reeves, from whose report, which is concurred in by two of the principal Houses in the Tea Trade, we have, for the most part, quoted, that it might be "better to confine the manufacture to one denomination, and call that *Congou*, letting the young shoots of the leaves expand on the trees until the hair is off them, and mixing them with the others which would give strength and body to the Tea, or a small portion might be gathered in the less expanded state and be called 'Pekoe;' the first mode would probably be the best in a commercial point of view, say to make only one sort, and that *Congou*, and thus form a good black-leafed Tea, such as the Tea trade want just now."

10. We are informed that the samples received from you may be valued relatively as follows:

A—1s. 10d. to 2s. per lb.

B—1s. 5d.

C—1s. 6d.

D—1s. 7d.

} The Muttock, enclosure, (No. 9.)

—1s. 8d. to 1s. 10d. per lb. { Assam Ka-hung Souchong, 2d crop, shady tract, enclosure, (No. 15.)

—1s. 3d. { the lowest price for common Congou. } Assam Souchong from Suddiya, enclosure, (No. 19.)

11. With respect to the manufacture, in addition to the remarks already transcribed, we transmit to you some observations by Mr. Reeves on the mode adopted by the Chinese, together with his remarks on Mr. Bruce's account of the manufacture in Assam, which you will forward for the information of the Tea Committee.

12. We know that the establishment employed by Mr. Bruce is comparatively small for the undertaking, and that having only two Tea makers, he states he is unable "to collect the Tea leaves at the proper season, the time occupied for gathering at one place is so great that the leaves become too old before he can reach another

MAY 8, 1839.

Agricultural Society of India.

A General Meeting was held in the Society's Rooms, Town Hall, on Wednesday, the 8th May, 1839.

The Hon'ble Sir Edward Ryan, President, in the Chair.

Thirty Members Present.

The Proceedings of the last Meeting were read and confirmed.

MEMBERS ELECTED.

The gentlemen proposed at the last Meeting were elected Members ; viz.

Messrs. W. S. Hudson, W. C. Braddon, Geo. Hill and J. C. Kiernan.

FOR ELECTION.

The names of the following gentlemen were read as Candidates for election at the next Meeting.

Chas. Fraser, Esq. (Commissioner in the Saugor and Nerbudda Territories), proposed by Dr. Spry, seconded by Dr. Wallich.

Major Halfhide, proposed by Dr. Spry, seconded by Dr. Wallich.

Geo. Remfry, Esq., proposed by Mr. W. Gibbon, seconded by Dr. Spry.

J. H. Fergusson, Esq., proposed by Mr. W. F. Fergusson, seconded by Mr. D. Hare.

Henry G. French, Esq. (Jessore), proposed by the Rev. C. E. Driberg, seconded by Dr. Spry.

Owen Potter, Esq., proposed by Mr. W. K. Ewart, seconded by Mr. Chas. Dearie.

NOTICE OF MOTIONS FOR DISCUSSION AT THE NEXT MEETING.

No. 1.—Proposed by Mr. R. Watson, seconded by the Secretary, “That the Agricultural and Horticultural Society, do aid Captain Jenkins in the development of the culture and manufacture of the Eri Silk, by the addition of 500 Rupees to that placed by him at the disposal of the Society.”

No. 2.—That the Society’s Gold Medal be presented to His Excellency M. Bedier, Minister of Marine, at the Isle of Bourbon, for the readiness with which he has met the Society’s wishes in promoting the introduction of the Cochineal Insect into Bengal.

LIBRARY.

No. 22, Madras Journal of Literature and Science.—*Presented by the Madras Literary Society.*

Hoare on the Culture of the Grape Vine.—*Purchased by the Society.*

Vol. VI. of the Society’s own Transactions was laid on the table for distribution.

MUSEUM AND NURSERY.

Samples of Assam Tea ; viz. Paho, 2nd quality, and Souchong, referred to in the Government Dispatch.—*Presented on the part of the Calcutta Tea Committee by Dr. Wallich.*

Two cases of Cacti covered with Cochineal Insects from His Excellency M. Bedier and M. Richard, Superintendant of the Botanical Garden at Bourbon, have been received since the last Meeting in capital preservation, at the Calcutta Botanical Garden.

Samples of Cotton with and without seed, from Guzerat.—*Presented by Wm. Kerr Ewart, Esq.*

Samples of twenty-one kinds of Paddy (Dhan) grown in the Hills in the independent Territory of Tipperah.—*Presented by R. Watt, Esq.*

A Specimen of Brown Sugar grown in the Soonderbuns, was presented by Mr. A. Harris, who has promised to forward a larger Sample for presentation at the next Meeting.

Three Bunches of Grapes, presented by Mr. McClintock, grown in his Garden at Ballygunge.

1.—ASSAM TEA.

The subject which first engaged the attention of the Society was a most important, and highly interesting communication made by the Calcutta Tea Committee. It consisted of a despatch from the Hon'ble the Court of Directors received by the last Overland Mail, dated 12th January, and for the better understanding of the same, an extract from the Committee's letter to the Government of India, dated the 20th March, 1838.

In a note to the President, accompanying these papers, "the Tea Committee request that he will do them the honor to present the above documents to the Agricultural and Horticultural Society of India, together with some samples of Assam Tea, to which they relate."

Extract from a letter from the Calcutta Tea Committee to the Revenue Department, dated 20th March, 1838.

1. We have the honor to report for the information of the Honorable the President in Council, that there are at present in readiness at our Office, for transmission to the Honorable the Court of Directors, a large supply of samples of Assam Tea, consisting of 12 large boxes of Paho and Souchong, assorted as follows :

Paho, 1st quality,	1 Box.
Ditto, 2nd,	4
Ditto, 3rd,	1
Souchong, 1st quality,	4
Ditto, 2nd,	1
Ditto, 3rd,	1

12 Boxes.

2. Each box contains on an average 19 seers, or 38 pounds of Tea, carefully packed in a leaden canister made by the manufacturers, lately arrived from Canton, and marked as above both in Chinese and English. The boxes are severally covered with the proper sort of matting, secured by slips of ratan, and addressed to the Honorable Court in the usual manner.

3. The consignment from which these samples were taken arrived in Calcutta on the last day of January. Owing to a deficiency in the original packing, and the great degree of dampness to which the boxes had been exposed during the passage from Assam, a con-

siderable proportion of the Tea, amounting to what would have filled about five boxes more, was either wholly spoiled or so much deteriorated, that no process, we believe, could have restored it to any thing like a fair quality. We have, therefore, registered all that portion as unfit to be sent home, at least, with the present supply, deeming it a matter of primary importance that the value of the first samples transmitted to Europe should not be diminished by any thing that might add to the many disadvantages under which they must necessarily arrive at a destination, where they will in all probability have to be subjected to the severe test of examination by the first Tea Inspectors in London.

4. We beg most particularly to urge on the consideration of His Honor in Council, that not only are the plants from which the leaves were gathered, still in their original wild and uncultivated state, but the details of the various processes employed in preparing and transmitting the Tea must obviously have labored under the many and serious difficulties and obstacles of a first attempt, but which it may reasonably be expected will be diminished and progressively be overcome as further trials are made. Besides which it ought to be borne in mind that, strange as it may appear, it is by no means settled whether it is not actually the Green sort, that has been prepared in the fashion of Black Tea, a point which can only be satisfactorily determined when the Green Tea manufacturers are set at work in Assam.

5. The Tea in question arrived here under the designation of Paho and Souchong. In assorting each of these into three qualities as noted in Para. 1st, our Secretary has been guided, partly by the opinion of the Chinese assistants now here, and partly by his own discrimination of the difference in the flavor and appearance of the Teas after they had undergone preparation for being repacked. Likewise and in the first instance by the various degrees of preservation, in which he received the cargo from Assam. The process of preparation alluded to above consisted in gradually drying the Tea over a nicely regulated coal fire, covered with ashes, in baskets made on purpose by the Chinamen, having the form of two inverted cones with their ends truncated and having an open sieve in the centre, (as described and figured in Mr. Bruce's Memoir on the manufacture of Tea in Assam, p. 5, figs. 9 and 10.) This precautionary measure our Secretary deemed absolutely necessary, to prevent mouldiness and consequent damage to the Tea during the sea voyage.

6. Our Secretary has been at pains to learn that it has always been customary in China, to bestow great attention in preventing consignments of Teas from being shipped on board vessels that have cargoes consisting of articles of strong savour, and which are known to be injurious to the delicate and fugacious aroma of Tea, whether by their odour or heating properties, or the like, and that it is usual even to plank off the space allotted for the chests; we accordingly solicit that such orders may be issued in regard to the shipment of the 12 boxes, as may be deemed best calculated to prevent any accident from happening to their contents from any of those sources. In case it should be deemed expedient to entrust the despatch to our Secretary's care we are persuaded he will use the best diligence and care to procure freight on an early ship at the lowest rate possible, and under such engagements as will prevent any chance of injury during the voyage.

7. We beg leave to forward the accompanying small muster of the 1st quality of Paho and a large canister of the 2nd quality of the same sort, regretting that we have none left of the Souchongs, every leaf of it having been consumed in filling up the boxes.

(Copies.)

REVENUE DEPARTMENT.

No. 2 of 1839.

OUR GOVERNOR GENERAL OF INDIA IN COUNCIL.

(Received by the last Overland Mail.)

Para. 1. Your advices noted in the margin*, refer us to your correspondence with the Tea Committee and to the reports of your proceedings generally on the subject of the culture of the Tea Plant in Upper Assam, subsequent to the date of your letter in this Department of the 26th February, 1838, which was replied to in our despatch, dated the 26th September, 1838, No. 12.

2. We receive with much satisfaction the samples of Assam Tea (twelve chests) alluded to in your letter, dated the 23rd May, 1838, and which arrived by the Calcutta in November last under the designation of "Pahi and Souchong."

* 21st May 1838, Paras. 44, 45.

23rd ,, ,, whole.

9th July, ,, Para. 31, 32.

10th Oct. ,, ,, 33 to 36.

3. Specimens of each sort have been very extensively distributed, and it affords us much pleasure to communicate to you that we have received very favorable reports regarding it, as well from the most respectable Brokers and Tea Dealers, as from several individuals, and various corporation towns and scientific bodies to whom it has been submitted.

4. Copies of the reports received from the Brokers and Tea Dealers named in the margin*, together with copy of one from Mr. Reeves, are forwarded for your information and for transmission to the Tea Committee.

5. We do not, however, consider that these specimens will have afforded the British public an opportunity of judging of the real merits of the Tea, which the Assam Districts are, we have no doubt, capable of producing, inasmuch as we find the best judges concur in opinion that the process of refining, to which, owing to the damaged state in which the Tea arrived in Calcutta, it was of necessity subjected, has very materially injured the present sample.

6. Nevertheless we resolved to direct eight chests of the Tea to be offered for public sale, the result of which is given in the margin†. The classification of the qualities and description of the Tea we have quoted from the report of the Tea Committee, dated 20th March, 1838, in order to afford you an opportunity of knowing precisely which of the chests of each sort were submitted to the public.

7. The result here exhibited will not of course lead you to the formation of any correct opinion as to the real marketable value of

* Mr. Twining.

„ Thompson, 2d reports.

„ Bland.

„ Boughey.

Messrs. Moffatt.

„ Stearns and Rowley.

Mr. Gibbs, and Messrs. Sanderson, Fry and Co.

† *Souchong*.

Lot 1, 1st quality, 34 lbs. net at 21s. per lb.

„ 2, 2nd „ 28 „ at 20s. „

„ 3, 3rd „ 37 „ at 16s. „

Pekoe.

„ 4, 2nd quality, 38 lbs. net at 24s. 6d. per lb.

„ 5, „ „ 40 „ at 25s. „

„ 6, „ „ 33 „ at 27s. 6d. „

„ 7, „ „ 35 „ at 28s. 6d. „

„ 8, 3rd „ 35 „ at 34s. „

the Tea should it arrive in quantities sufficient to be considered a staple article of commerce ; on the contrary it can only be considered as a fancy price occasioned by the great excitement and competition created by the novelty and curiosity of the sale.

8. For the formation of a more accurate judgment we refer you to the report of Mr. Thompson alluded to in Para. 4, and to the letter addressed by Messrs. Steams and Rowley to the mayor of Liverpool wherein an offer is made to contract for 500 or 1000 chests at 1s. 10½d. to 2s. per lb.

9. You will continue to encourage in such manner as you may deem most advisable the cultivation of Tea in Assam, and with reference to our Despatch under date the 26th September, 1838, we shall expect to receive a further supply as soon as a sufficient quantity has been prepared in accordance with the instructions therein conveyed to you. At the same time we shall be glad to receive from you any suggestions with respect to future plans, particularly as to the best means of encouraging the cultivation of the Tea with as little present loss to Government and as great prospective benefit to commerce as possible.

10. It would further be very desirable to receive as accurate information as possible with regard to the price at which the Tea is now manufactured, including merely the cost of labour, manipulation, packing per chest, and the landing at Calcutta.

We are, &c.

(Signed) J. L. LUSHINGTON.
R. JENKINS.
JOHN LOCH.
P. VANS AGNEW.
J. WARDON.
C. MILLS.
J. W. MASTERMAN.
M. F. SMITH.
J. THORNHILL.
H. SHANK.
JOHN FORBES.
JOHN COTTON.
GEORGE LYALL.

London, 23rd January, 1839.

MR. RICHARD TWINING.

Strand, 28th December, 1838.

I commenced a letter upon the subject of the Assam Tea, but I was unwilling to trouble you with it, finding that upon further trial of our sample, I had nothing to say, in reference to the flavor, beyond the opinion already expressed as to the culture and manufacture, &c. I knew you had the opinion of those experienced persons, who were better qualified than myself to speak on these points.

The chairman, however, having had the kindness to favor me with a fresh sample of Souchong and some Pekoe, which is now put up for sale, affording another opportunity for examination of the produce of Assam, I think you may like to know, and I consider it right to state, the opinion of our house, that in the two last samples there is a decided improvement, in as much as the burnt flavor (proceeding, I imagine, from an injudicious application of fire) although very perceptible, is much subdued, and the leaf, in general, is more even and better twisted. Perhaps in this early stage of the cultivation it is not reasonable to look for those specimens of really fine Tea, which I conceive it is most material to aim at obtaining with a view to extend the already vast demand for the article in Europe, and in this country in particular, and to bring the produce of Assam by any means on a level with the best sorts of Tea produced in China.

(Signed) R. TWINING.

MR. WILLIAM JAMES THOMPSON.

Dunster Court, Mincing Lane, 22nd December, 1838.

I have to report that I have examined the Assam Teas which are to be sold in my sale of January next, and that No. 11, Souchong is of a large well-twisted Pekoe kind of leaf.

No. 5, Souchong is of a large black leaf with some brown, the leaf generally rather coarse and not so well twisted as No. 11.

„ 6, „ A mixture of large coarse leaves with some pale brown untwisted ; this Tea is good-flavored, but the leaf, if for the purpose of trade, should be better manufactured.

No. 2. Pekoe—a well made largish ivory-blackish leaf, appears to have been “refired,” and the leaf in consequence of a deeper black.

“ 79 { Pekoe—a similarly well made leaf to No. 2, but not so
“ 10 { black, and having also more (“points or downy
ends”) flower than it.

“ 8 “ A well made ivory greyish leaf with a fair quantity of flower. This Tea for make and size of leaf much resembles Pekoe of the growth of China.

(Signed) WM. JAS. THOMSON.

MR. RICHARD GIBBS.

White Hart Court, 26th December, 1838.

I have minutely examined and tasted the Assam Tea, and do not hesitate to pronounce it of superior quality and *undoubtedly* from the *same plant* as the Chinese, which circumstance will, I trust, at no distant period, open a wide field for British enterprise.

In its general appearance it differs widely from the Teas imported from China, it being neither “flowery Pekoe” nor “Congou” denominated “Peeke kind” but an admixture of both, with this difference however, that, in its relation to the former (“flowery Pekoe”); the blossom is destitute of the fine downy (or as the Chinese term it, the “White Hair”) appearance, being of a dull brownish white, and of a harsh or horny substance—in relation to the latter (“Pekoe kind”) it is also destitute of the ripeish reddish leaves, being much more large and open, and conveying the conviction, that it has been *over-fired* or *scorched* in the cure.

On infusion, the color of the liquor is of the highest character, being of deep rich red, the flavor is of high burnt, or malty Pekoe, and *very pungent*, but totally void of the fragrance or aroma, which belongs to the China Teas of first qualities, and *dissimilar* to any which I have ever tasted.

I do not attribute this, however, to the quality in the first instance, but to a want of skill in manufacture, there having been by the introduction of *over heat*, too great a proportion of the *vegetable* matter extracted.

The leaves after infusion are fully corroborative of quality, being very bold, perfect and serrated.

The slight defects which I have alluded to, may however be soon overcome, and I trust, that the day will shortly arrive, when *Indian* or *Assam* Tea, may vie in *every* respect with that of *China*.

(Signed) R. GIBBS.

TO THE MAYOR OF LIVERPOOL, HUGH HORNBY, Esq.

Liverpool, 128, Dale Street, 17th December, 1838.

Sir,—In compliance with a request from Messrs. Brodribb and Cooke, “that we would forward to you our opinion and valuation of the Tea produced in Assam,” we beg to state that we consider it (with a few exceptions) as good Tea as may be usually imported into this country from Canton, the only difference appearing to us, being in the method of curing or drying the leaves, and the sample submitted to our inspection has been over-dried, and evidently has not been treated in the way the Chinese prepare their Teas.

We character the Tea in question as “preferable to but middling Tea” or brisk, slightly burnt flavor (not objectionable) and possesses **STRENGTH**—“the leaf is on the large DULL black Pekoe kind, value 1s. 10½d. to 2s. and at this valuation we should have no objection to enter into a contract for 500 or 1000 chests.

We remain, &c.

(Signed) STEAMS AND ROWLEY.

MESSRS. SANDERSON, FRYS FOX AND CO.

6, Old Jewry, 12th of 12th month, 1838.

We have examined and tasted the two samples of Black Tea imported from India. They present in the appearance of the leaf the same characters as many received from China, and we should say that the plants from which they were collected must be good.

The Tea, however, has evidently been materially injured by the mode of preparation, having been far too highly dried, so as to give it a very burnt taste, which destroys the real flavor. Had it been properly cured, our impression is that the quality would be very good.

(Signed) SANDERSON, FRYS FOX AND CO.

MESSRS. T. AND R. MOFFATT.

11, *Mincing Lane*, 10th December, 1838.

In accordance with the wish expressed by you at the time you favored us with a sample of the "Assam Souchong" grown in the Honorable Company's territory, we now beg leave to report our opinion of the quality of the same. The precise character which we attach to it is

"Middling tea, strong, high burnt, of large bold, black Pekoe leaf, with some flower in smell, rather heated."

We consider the specimen of Tea now under review to have been materially injured by being over-fired, which, as well as giving it a heated smell and burnt flavor, has most probably destroyed its fragrant properties; the entire absence of this latter quality, we regard as its chief and great defect, as on the other hand, we view as its leading recommendations the great strength which it possesses and the perfect color of, and bloom on, the leaf.

As a whole, its properties we consider to be much more those of Pekoe than of Souchong Tea regarded as Pekoe; its leaf though slightly coarse or rough in appearance is very handsome, not alone from its face but from its boldness and size; the color of the leaf too after infusion, is of that rich bright brown which characterizes Pekoe Tea, but is more closely folded and less broken than the leaf of that species generally runs.

(Signed T AND R. MOFFATT.

MR. GEORGE BOUGHEY.

29, *Mincing Lane*, 19th December, 1838.

I have examined and tasted five samples of the Assam Tea now on shew in the Honorable East India Company's Ware-house, New street.

Viewing this small importation as an experiment, I consider it perfectly successful; there is no doubt in my mind of the identity of this and the Chinese Tea Plant; all the results of tasting the infusion, the smell of the warm leaves in the pot, the form of the leaves after extended by infusion, tend fully to establish this fact. There is some dissimilarity however in the appearance dry as taken from the chest; the leaves are larger and the color of a deeper black than the Chinese Tea, especially the Souchong, which has another peculiarity

not noticed in the Chinese Souchong of a silvery appearance at the point of some of the leaves, technically described in the Tea trade, as Pekoe Tips. The only other feature which attracted my notice was its weight, which in the hand is considerably greater than the best quality of black Tea imported from China. This dissimilarity is still greater in the Pekoe than in the Souchong, but in all other respects this kind more closely resembles the Chinese Pekoe in appearance. The color of the infusion is of a similar character to the finest qualities of Chinese black Tea; viz., a clear bright red, with the exception of lot 3, No. 6, which is paler. The taste can only be described technically as something of the Pekoe Souchong flavor very strong, (but there is no doubt this would undergo some change by age in this country,) and it essentially possesses all the astringency and pungency of the Chinese Plant. I do not consider from the care manifestly taken in the preparation of these samples, that it is possible to supply a suggestion calculated to be of service in the further prosecution of the manufacture as so much promise is held out in this early attempt. I am sanguine that the same energy which accomplished this will remove all the difficulties which may interpose themselves to the ultimate perfection of its object, and if the production can be accomplished at a similar cost to the Chinese, that it will be as generally consumed in this country.

(Signed) G. BOUGHEY.

MR. W. J. BLAND.

28, Fenchurch Street, 13th December, 1838.

I have to apologize for neglecting so long to communicate the result of inspection and trial of the Assam Tea, feeling however considerably interested on the subject. I have repeatedly tasted the article and now hand you the opinion suggested thereby.

First. From a minute inspection of the leaf both before and after infusion I should say that there is no question as to the identity of the plant; the *hard* and horny appearance of the ends of the leaves would at first sight suggest a doubt of this.

Secondly. I find *powerful crude strength* in these specimens, such as is not peculiar to any description with which we are familiar; after scalding for five minutes, then a second time for seven, and a third time for ten minutes, an astringent or dry pure vegetable bitter remained, which convinces me that most of the modifications in fla-

vor with which we are acquainted depend mainly on the manipulation, and that the best growths are sensibly affected by differences of season and any unskilful management.

Thirdly. As the harsh white points (so different from the delicate soft ends of our Pekoe and Pekoe kinds) entirely disappear when the leaf is well saturated but again characterize it when redried, I gather the idea that if subjected to a more perfect process of curing it would lose the crude or woody stalky flavor which fills the mouth and hangs about the palate, and as the leaf became more supple the aroma would predominate instead of being hidden by the harsher taste.

Lastly. It will appear that this preparation of the Tea plant possesses more yielding stamina than most if not all the sorts imported from China, but, that *part of this strength* is a disparagement, destroying all softness and full fragrance which ought to be found in a leaf so well matured. There is a slight tendency to the Hung, Mucy flavor in the sample of "Souchong," but more in the "Paho," and no approximation to the known *Souchong* flavor in either.

It may be right to add, that the leaves of both being covered on the under side with a *white down*, this by hard twisting exhibits the *white ends*; the horny character of these is owing entirely to a fault in the process and presents no difficulty which may not be easily overcome.

(Signed) W. J. BLAND.

MR. T. REEVES.

Assam Tea, per Calcutta, November, 1838.

Souchong.—This Tea has a large black Hung, Mucy kind of leaf, with a few brownish ends, feels harsh in hand, smells as if it had been (damaged and) refired, tastes burnt, coarse and rather bitter.

Pekoe.—Somewhat similar in manufacture, larger and more mixed in leaf, inferior in taste and smell.

Under the name of "Assam Tea" and as novelties, these Teas would probably meet a ready sale, and perhaps at a higher price than the real, merchantable value. Still I should hesitate about submitting them to sale, as I fear the quality is not good enough to stamp a favorable impression on them for the future. But upon this point I would refer you to the London Brokers who can give much more satisfactory information than I am able to do.

I do not think they come under the denomination given to them ; the one is too large a leaf, too dull a black in color, and too deficient in the white leaves to be called Pekoe (literally "white hair"); the other is certainly not like Souchong in make or appearance, and the public apparently have a prejudice against the name of Souchong at present. If any denomination is given I should thing "Congou" the best.

These Teas appear to have been made by persons more conversant with the manufacture of Aukoi Teas than the regular Voo Eeshan Teas, and to this I attribute the defects, for I see no reason why such "leaf" should not be made into a more merchantable Tea ; a better selection of the sieve, of smaller and more regular-sized leaves, and a greater care in the process of drying and firing would contribute much towards this.

(Signed) T. REEVES.

In addition to the foregoing, the Reports from six Liverpool Brokers on the same subject, and equally favorable, were presented by Mr. Willis.

As an opportunity for extending the cultivation of the Tea plant in India, the Secretary read a letter from Edward Sterling, Esq., Collector at Burdwan, calling the attention of the Society to the apparent fitness, both in soil and climate of that district, for the introduction and culture of the Tea plant. Dr. Wallich stated that a supply of plants had just reached the gardens, and at the recommendation of the Society, he was pleased to say, he thought the Tea Committee would willingly place a few of them at the disposal of Mr. Sterling.

2.—*Production of Silk from the worms thriving on the Common Castor Oil Plant.*

The subject of encouraging the Eri Silk manufacture by money prizes, was brought forward in the form of a communication to the Society from Captain Jenkins in Assam, who speaks of the worm being in great abundance in that Province and one which deserves the first attention. The Eri Silk worm (*Phalœna Cynthea*) is independent of all seasons. It thrives luxuriantly on the common Castor Oil plant, but all attempts hitherto made to wind off the Silk from the cocoons have failed, owing to the want of knowledge of the pro-

per solvent for the gum which adheres to the cocoons. Under these circumstances, Captain Jenkins comes forward with the handsome offer of 500 rupees, which he places at the disposal of the Society—

1st. For the discovery of an effectual solvent for the gum, so that the silk can be reeled off.

2nd. For the best mode of preparing a fine thread from the floss.

3rd. For the readiest and best method of bleaching the cloth so as to take dyes well.

The Society impressed with the value of the contribution and the importance of lending its utmost aid to the promotion of so useful a culture, were pleased to determine that every assistance should be rendered to Captain Jenkins, and accordingly the Notice of Motion given by Mr. Watson, seconded by the Secretary, at the head of the Proceedings, was submitted.

3.—*The Removal of the Discriminating Duties on Tobacco and Rum, the Products of British India.*

The question which next came before the Society was the consideration of the propriety of adopting some steps to bring to the notice of the Home Authorities the difficulties which the industry of this country has hitherto laboured under by the impost of a heavy duty on Tobacco and Rum from India whenever any attempt is made to land them in Great Britain, over that which is charged on importing similar articles the produce of the American and West India Colonies.

The subject was brought before the Society in the form of a representation from the Tobacco Committee (*vide Appendix*) which was read to the Meeting by the President, who stated how important to the Agricultural Interests of India, the removal of such a burthen was. A discussion in which several Members took part ensued, and all bore testimony to the discouraging exaction as it now stood. At the termination of the remarks the following Resolutions were put from the Chair and carried unanimously:—

Proposed by the Honorable Sir E. Ryan, seconded by W. F. Fergusson, Esq. and resolved,—

1st.—That this Society fully persuaded of the positive loss which the country sustains by the exaction of threepence the pound weight on Tobacco, and six shillings the gallon on Rum, the produce of the

British possessions in the East Indies, in excess to that imposed on the importation into the mother-country of similar articles when received from the British possessions in America and the West Indies

2ndly.—That the Secretary from the necessity which exists for immediate despatch to save the Overland Mail, be instructed therefore respectfully to address, through their respective Secretaries, the Right Honorable the President and Board of Control and the Honorable Court of Directors on the subject, intimating at the same time that a similar communication will be made to the Government of Bengal—*(For the letter see Appendix.)*

4.—*Growing Demands of England on the Agricultural Wealth of India.*

The Secretary submitted a communication from the Chamber of Commerce of Bengal, transmitting a copy of a Memorial lately presented by the President, Vice-President and Members of the Chamber of Commerce and Manufactures at Manchester, in deputation to the Honorable the Court of Directors. The communication is made to the Agricultural and Horticultural Society of India by the Bengal Chamber, as the subject contained in the Memorial is considered by its members, “to be of vast Agricultural and Commercial importance, claiming the co-operation of this Chamber towards the attainment of the object contemplated.

“Bearing cordial testimony to the extensive usefulness of your Society, the Chamber doubts not it will cheerfully afford whatever aid may be within the sphere of its operations to promote the views of the Manchester Association. Meanwhile the Agricultural Society of India cannot but be well pleased to find influential bodies at home, such as the Manchester Chamber of Commerce and Manufactures, directing their attention earnestly and actively to the improvement of the great Staples of India,—a field where your Society is labouring with so much advantage to the community and high credit to itself.”

(Copy.)

To the Court of Directors of the Honourable East India Company.

The Memorial of the President, Vice-President and Directors of the Chamber of Commerce and Manufactures at Manchester,

Sheweth, that your Memorialists are deeply impressed with the advantages which are derived by this Country and British India from

their commercial relations with each other ; and that the interest of each of these portions of the Empire will be advanced by such measures as may tend to develope the resources and industry of either.

That your Memorialists believe that the agricultural resources of the vast empire of British India, are capable of almost unlimited extension, and of supplying Great Britain with articles of primary necessity (many of which are now in a great measure derived from foreign sources) to the great benefit of our Indian fellow-subjects, as well as to that of the shipping, the commerce and the manufactures of the mother-country.

Your Memorialists respectfully draw the attention of your Honorable Court to the very great importance which attaches to the cultivation of Cotton.

The quantity of Cotton imported into Great Britain in the first eleven months of the present year, amounts to 1,374,316 bales, of the value of 14 millions £ stg. in its unmanufactured state. Of this quantity 122,397 bales have been received from British Possessions in the East and West Indies, 26,281 bales being from the West Indies, and 96,116 from the East Indies. The Cotton from India amounts to about £600,000 or only 5 per cent. of the whole value of Cotton imported, about 90 per cent. of our supply being drawn from foreign sources.

The importance of this great trade is evident on referring to the fact, that the value of Cotton after being manufactured amounts to 40 millions £ stg. per annum, giving freight to 300,000 tons of shipping, and employment to upwards of two millions of persons, engaged in the various stages of its manufacture.

In addressing your Honorable Court on this subject, your memorialists will not offer any apology for placing before you the importance of this branch of trade to the country, being fully sensible that, although your immediate duties are directed to the government of India, you entertain those liberal and enlightened views which will embrace the interest of the empire at large.

A regular and independent supply of Cotton in this country, it is of the greatest possible importance to secure. How much more desirable, then, for us to look for this supply to our fellow-subjects in India, than to be dependent upon any foreign country for it ! It must be obvious to your Honorable Court, that depending almost

entirely on one source of supply, if any interruption of that supply should occur, either from national hostilities—a change from slave labour to free labour—or from other contingencies, the most distressing consequences would inevitably fall upon the large manufacturing population of this country.

The whole of the Cotton imported from India is conveyed hither by British shipping; whereas a very large portion of the foreign Cotton is brought to us by foreign ships.

By extending the cultivation of Cotton in India, the natives of that country would acquire greater means for procuring the comforts and conveniences of life, of advancement in civilization, of improvement in the revenue, and would be more firmly bound in their connexion with this country, as their Governor, by these advantages; and the amount of taxation would be less burthensome to them, because they would be better able to bear it.

Your Memorialists have not any doubt, that the great continent of British India, with its immense and industrious population, is capable of producing, from its varied climate and soil, every quality of Cotton that may be desired, and to any extent which our increasing manufactures may require, and at a less cost than from any other country in the world.

The inferiority of the quality of East India Cotton has been the greatest impediment to a more extensive consumption of it in this country; and though it will be difficult, and must prove a work of time, to effect a change in this most important particular, yet your Memorialists most respectfully submit it as their opinion, drawn from the best sources of information they have access to, that this difficulty is not insurmountable, and the very great importance of it to both countries will, they hope, excuse them to your Honorable Court for venturing a few remarks upon the subject.

1st. The amount of Land Tax, extending generally, as your Memorialists are informed, to the maximum which the grower has the means of paying, destroys the stimulus to improvement and exertion, and a modification of this seems to be essentially necessary.

2ndly. The tax being levied in kind, appears in its working, to be particularly objectionable, inducing the grower to produce quantity or weight of Cotton, without regard to quality or cleanness.

3rdly. The want of roads in India, your Memorialists consider to

be very much against Cotton cultivation, not only by greatly increasing its costs, but by the deterioration of quality consequent on exposure to the effects of the weather in its transit to a shipping port.

4thly. The want of Warehouses or sheds in which to deposit the Cotton at the commencement of the rainy season, and the want of Piers or Quays generally at the shipping ports, lead greatly to the injury of the quality.

5thly. Every inducement which can with propriety be held out to capitalists to embark in the cultivation of Cotton should be offered to them.

Your Memorialists most respectfully request of your Honorable Court to take these premises into your serious consideration, and to devise and adopt such measures as may appear to you to be most conducive to the extension of the Agricultural Resources of India, and particularly for the improvement of the quality, and the extension of the cultivation of Cotton.

And they will ever pray.

Manchester, 7th Dec. 1838.

(True Copy)

W. LIMOND, *Secy. D. C. of Commerce.*

In connection with this important communication, the President adverted to what the efforts of the Society, both at its abandoned farm at Akra, and in the dissemination of seeds, had hitherto been, and in return for this valuable document a reply was directed to be made in which should be embodied an outline of the chief particulars of what the Society has done in this important culture. Moreover as no tidings have reached the Society from the Board of Trade in England, regarding the despatch of fresh seeds, the polite offer of Mr. Huffnagle to obtain the annual consignment of seeds, to the amount of 1000 rupees, was cheerfully accepted.

5.—Approval by Government of the Society's measures for obtaining information on Agricultural Statistics.

The Secretary read to the Society a letter addressed to him by the Secretary of the Government of India in the General Department, intimating "that the Honorable the President in Council approves the circular and forms adopted by the Society for the collec-

tion of information on Agricultural Statistics required for the accomplishment of the objects pointed out in the papers transferred to the Society by Government, and hopes the information collected will be trust-worthy and lead to useful practical results."

6.—*Additional Illustration of the Superiority of the soil of Guzerat for the Production of Cotton.*

In addition to the information conveyed to the Society by Mr. Ewart at a former Meeting, this gentleman presented on the present occasion parcels of the Cotton of Guzerat with and without seed. The cleaned Cotton had been freed of seed at Bombay by the American Sawgin, but it was found to cut the staple and thereby injure the quality of the Cotton in the market. Dr. Burn, a correspondent of Mr. Ewart's brother, thus expresses himself—"The plant is, I think, something between the common Broach and Bourbon; the natives here call it "Nurma," and it is valued at nearly double the common country kind. In 1816 Dr. Gilder cultivated Bourbon. I propagated from some plants I found in the hedge-rows, near where his experiment had been conducted, and if it be Bourbon it has become changed in some way, and is evidently well suited to be of value now. *This is my opinion after some seasons' observation, and I intend to go on increasing it.* It requires a dry sandy soil and no irrigation; water or manure sends it all to leaves and branches. Slight elevated sand hills are the proper situations—sown at the beginning of the rains, it yields almost no Cotton the first year, but is in full bearing the 2nd and 3rd. The bushes do best at 4 or 5 feet apart. I find fully 2-3rds of the produce is seed; from each bush, 60 rs. in weight of kuppas, 20 of which will be clean Cotton."

7.—*Fresh Arrival of Cochineal Insect and Nopals from the Isle of Bourbon.*

The next communication made to the Meeting by the Secretary was, the receipt of letters addressed to the President, Dr. Wallich, and himself, touching the despatch in the "Emma," of a consignment of Cochineal Plants and Insects through MM. Bedier and Richard from the Isle of Bourbon.

M. Bedier in forwarding this valuable despatch, first presents, in most polite terms, his thanks for the former vote of the Society, and

M. Richard acknowledges in terms equally expressive, his sense of obligation for the present by the Society of their gold medal. These gentlemen then go into the particulars as to the method adopted by them in securing the safe arrival of the Insects and Plants, and testify, by the care and solicitude with which they have proceeded in the preparation and eventual package, their warm co-operation in the highly useful object which the Society have in view in introducing the *fine-grained* Cochineal Insect in Bengal. These gentlemen further add that, although at the time of the year they wrote, the Insects were least plentiful, yet they had other Plants in preparation "*je crois pouvoir vous assurer qu'avant peu de temps vous recevrez une autre caisse avec des nopals et des cochenilles.*"

The President in bearing testimony to the generous conduct of these two gentlemen in promoting, in so disinterested a manner, the introduction and advancement of this important culture in Bengal, begged to remind the Members, that these exertions could not be too highly estimated, and as a mark of the deep obligations which they all must entertain for so worthy a benefactor, he begged to give notice of the motion before announced.

8.—*The Society's annual supply of Cape seeds.*

The Secretary called the attention of the Members, to a letter which he had received from Mr. Villet, at Cape Town, informing him, that the annual despatch of garden and flower seeds would leave Cape Town in July, so as to be in Calcutta by the end of September, at furthest, and expressing his regret, that the reported failure, and dissatisfaction in consequence of the last year's consignment, should have been so general.

In connection with this subject, the President took occasion to intimate to Members, that the state of the Nursery at the Botanic Garden, with the large consignment now on its way down the river from the Botanic Garden, at Seharanpore, of fruit trees, would enable Members to be supplied on the setting in of the rains; and in consequence of this announcement it was determined, that the Nursery Committee should meet and devise the best means to be pursued in the mode of distribution.

9.—*Sugar-cane in the Goomsur country and at Azimghur.*

Captain Hill when in Calcutta a few months since took away with him a small stock of Otaheite and China Canes, and in a note addressed to F. P. Strong, Esq. he writes, "The Sugar-canes you gave me were planted at Arka immediately on my return home from Calcutta; the China canes came up to a cutting, and there are about 200 plants of the Otaheite cane—all thriving. I think it likely we shall plant all the cuttings we can get and make some sugar from them in the season of 1840-41."

An extract of a letter from Mr. Hunter at Azimghur was also read, stating that he had "made over to Mr. Collie upwards of a thousand canes to be cultivated in the Goruckpore District for his Sugar Mill, and had also sent China Cane to be used as fodder."

For all the foregoing presents and papers the thanks of the Society were accorded.

HENRY H. SPRY, M. D.

Secretary.

APPENDIX.

No. 1.

Minute by the Members of the Tobacco Committee.

The Members of the Tobacco Committee, beg to bring to the notice of the Society, the difficulty under which the country labours by the imposition of a discriminating duty on her Tobacco, of three-pence the pound on importation into the Mother-Country,—and six shillings the gallon on her rum,—and desire to urge on the attention of the Members, the propriety of taking immediate steps for recording their sentiments for transmission to the Home Authorities, with the expression of a hope that this discouraging impost may be removed, and the Agricultural Industry of the country be thereby protected.

To facilitate this desirable object,—your Committee have imposed on themselves the task of drawing up a form of representation, which they now have the pleasure to submit for the Society's consideration.

(Signed)

T. LEACH.

D. HARE.

N. WALLICH, M. D.

C. TREBECK.

F. P. STRONG.

D. W. H. SPEED.

No. 2.

To JAMES CASMO MELVILLE, Esq.

Secretary to the Hon'ble the Court of Directors, India House, London.
SIR,

The Agricultural and Horticultural Society of India, impressed with the importance and necessity of using every effort in its power to bring forth the natural resources of British India, in order that the people and the State may alike possess the advantages which universally accompany an extended commerce, has, in the progress of its labours, become convinced, that great and lasting good may be rendered to the Commercial and Agricultural Interests of India by the abolition of the discriminating distinction, in duty, which is now made on the importation, into the United Kingdom, of Tobacco and Rum, the produce of the British possessions in the East Indies, and similar Articles, the produce of the British possessions in America and the West Indies.

2nd. Under these circumstances, the Agricultural and Horticultural Society of India has desired me, by a resolution moved by the President, seconded by W. F. Fergusson, Esq. and unanimously adopted at the General Monthly Meeting held this day, that I should respectfully address you on the subject, to solicit you to bring the question to the notice of the Honorable the Court of Directors; — and further that I should forward a similar communication to the Secretary of the Board of Control for the information of the President, and Board,—the Society feeling it to be its duty not only to urge the importance of the subject, but to express its hope that the Honorable Court and the Board will exert their powerful influence, to obtain an object the possession of which will be conducive of so much real benefit to the general interests of the country.

3rd. Of the fitness of the soils of India to produce Tobacco to any extent, the records at the India House as well as of the Society, and the specimens in their possession, afford abundant testimony; —but the restriction of threepence the pound duty in excess to that charged on what is the growth of the British possessions in America, has acted hitherto, as tantamount to a prohibition to its importation into the mother-country, and has so narrowed its foreign demand generally, that although every where grown by the people of India, it has, as yet, scarcely formed a material article in the External commerce of the country.—This assurance will be better understood by reference to the accompanying official Calcutta Custom House return.

	To what place.	Quantity in 1836-37.	Quantity in 1837-38.	
			<i>Tons.</i>	<i>Cwt.</i>
Tobacco (in leaf.)	Great Britain, ..	Included under the head of all other exports.	69	0
	Madras and Coast, ..		123	5
	Mauritius, ..		54	5
	Ceylon, ..		1	10
	China, ..		0	10
	Pigu, ..		14	10
	Bombay, ..		45	5
	Gulphs, ..		28	5
	New Holland, ..		5	5
	Penang, ..		14	15
	Maldives, ..		0	5
	Singapoor, ..		5	10
	Demerara, ..		1	0
	Total,...		363	5

4th. In the article of Rum, the extra impost of six shillings the gallon acts most injuriously to the extension of the Sugar plantations in this country.

5th. The Society with great respect refers to this subject with the sincere assurance that the Interests of British India, over which the Honorable Court are appointed to preside, will be consulted and promoted by an early consideration of so important a burthen, the removal of which would, unquestionably give a stimulus to the investment of capital, and greatly contribute to the promotion of the Agricultural prosperity of the British Indian possessions.

6th. Further I beg to state, in order that no misconception may be entertained on the course adopted in transmitting this communication to you, that a duplicate will be forwarded to the Government of Bengal, for formal despatch to the Honorable Court, but as the overland packets for England have left this two days' since, and no certain mode of speedy conveyance remaining open for the next three months to come, the Society are compelled, that this may reach you by the present opportunity, to deviate in some measure from the strict line of communication in practice, which it is hoped will therefore be excused, but which under ordinary circumstances it is so desirable should be pursued.

I have, &c.

(Signed) H. H. SPRY, M. D.

Secretary.

*Agricultural and Horticultural Society's Rooms,
Town Hall, Calcutta, May 8, 1839.*

JUNE 12, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Rooms, Town Hall, on Wednesday, the 12th June, 1839.

The Hon'ble Sir Edward Ryan, President, in the Chair.

Twenty-five Members Present.

The Proceedings of the last Meeting were first read and confirmed.

MEMBERS ELECTED.

The gentlemen proposed at the last Meeting were elected Members ; viz.

Messrs. Chas. Fraser, Geo. Remfry, J. H. Fergusson, H. G. French, Owen Potter, and Major Halfhide.

FOR ELECTION

The names of the following gentlemen were read as candidates for election at the next Meeting :

W. F. Stewart, Esq., of Mirzapore—proposed by Mr. W. Storm, seconded by Mr. D. W. H. Speed.

J. W. Laidlay, Esq.—proposed by Mr. Robt. Watson, seconded by Dr. Spry.

A. K. Lindesay, Esq., (Civil Surgeon, Benares)—proposed by Dr. Spry, seconded by Dr. Wallich.

H. Falconer, Esq., M. D., (Supt. of the H. C. Botanical Garden at Saharunpore)—proposed by Dr. Wallich, seconded by Dr. Spry.

Lieut. Colonel D. Presgrave—proposed by Dr. Spry, seconded by Mr. W. Storm.

Archd. Sconce, Esq., (Collector at Chittagong)—proposed by Dr. Spry, seconded by Mr. Jas. Colquhoun.

L. J. H. Grey, Esq., C. S., (Berhampore)—proposed by Mr. W. G. Rose, seconded by Mr. Wm. Storm.

R. C. Halkett, Esq., (Magistrate and Collector of Dinagepore)—proposed by Mr. Jas. Grant, seconded by Dr. Spry.

MOTIONS OF WHICH NOTICE WAS GIVEN AT THE LAST MEETING.

Grant of Five Hundred Rupees for the Promotion of the use of Eri Silk in the Arts.

The Society first entered into the consideration of the motion made at the last Meeting by Mr. Watson relative to the propriety of adding the sum of 500 rupees to the contribution of a similar sum by Captain Jenkins for the purpose of encouraging, by money prizes, the best means of promoting the use of the Eri Silk in the Arts.

Mr. Robison and Dr. Spry severally addressed the Meeting, and the motion was carried unanimously.

Vote of a Gold Medal to His Excellency M. Bedier.

The proposition made by the President at the last Meeting, to mark the sense which the Society entertains for the valuable services of M. Bedier in assisting the efforts of the Society to introduce the Cochineal insects into Bengal, that the Society's Gold Medal be awarded, was carried unanimously.

NOTICE OF MOTION.

Proposed by Mr. H. Piddington, seconded by Mr. C. K. Robison :

"That in reference to the communication now read from the Hon'ble the Court of Directors of the East India Company, and with the view of aiding, as far as possible, the intentions therein expressed, and the labours of those scientific gentlemen at home, who have so kindly interested themselves in the subject,—a Committee be formed for the purpose of suggesting such plants and trees as may be thought desirable for introduction into India and those that can be furnished in return, and that the Committee be instructed to obtain communications from the Branch Societies and other available sources throughout India."

LIBRARY.

1. A History of English Gardening, Chronological, Biographical, Literary and Critical, tracing the progress of the Art in this country from the invasion of the Romans to the present time. By George W. Johnson, 1 vol. 8vo.—*Presented by the Author.*

2. A Pamphlet on the use of crushed Bones as a Manure. By Cuthbert William Johnson, Barrister at Law, Corr. Member of Maryland Hort. Society.

3. A Pamphlet containing Observations on the Employment of Salt in Agriculture, with directions for its application, founded on practice. By Cuthbert William Johnson.

4. A Pamphlet on Liquid Manures. By Cuthbert W. Johnson. *The three foregoing brochures were presented by George W. Johnson, Esq.*

5. Proceedings of the Agricultural and Horticultural Society of Madras.—*By the Society.*

The Secretary in presenting this brochure to the Meeting, directed the attention of the members to an error which the General Committee of the Agricultural and Horticultural Society of Madras has fallen into, similar to the one lately made by the Bombay Agricultural Society. The Madras Society consider that the Agricultural Society of India receive an annual donation from the Government of 2,675 rupees, whereas it only receives 1,000.

6. A Pamphlet on the cultivation of Flax in India.—*Presented by Alexander Rogers, Esq.*

MUSEUM AND NURSERY.

1. A specimen of Cotton grown in the Mymensing District.—*Presented by Mr. Hudson, Deputy Collector.*

Note.—Mr. Hudson in a note to Dr. Spry mentions, that the sample now submitted was the one he originally designed for the Museum and not the former sample, condemned by the Society as bad, which was nothing more than the padding of his elephant gудdee and sent by the mistake of his servant. The Cotton now submitted is short in staple, but a useful Cotton.

2. A few Bootan Walnuts, the produce of Aleuritis triloba.—*Presented by Lieutenant James Wemyss.*

3. A specimen of Brown Muscovado Sugar, manufactured from Cane, grown in the Soonderbunds.—*Presented by Mr. A. G. Harris.*

4. Twenty-five bags of Brazil Cotton Seed ; presented by Mr. C. J. Richards. *Particular allusion was made to the value of this contribution of Mr. Richards, and Dr. Spry stated, that he had already forwarded a quantity of it to Tírhoot, Chittagong, and Kishnaghur.*

5. A small supply of acclimated Mauritius Black Bean, ("*Pois noire*") an excellent fodder for cattle ; *grown in the Society's Nursery.*

6. A bunch of Grapes, from a vine growing in the garden belonging to the Vicarage of the Roman Catholic Church at Moor-
gheehutta.—*Presented by Mr. Crow on behalf of the Vicar.*

7. A Squash, grown from American seed in the garden of Mr. Wm. Storm.

8. A specimen of Tobacco from Sandoway and a quantity of Cashew Nuts from Hidgelee.—*Presented by Dr. Spry.*

9. A few Capsules of the Rock plant, (a species of *Didymocarpus*).—*Presented by Captain William Barnett.*

This elegant little flower is indigenous to the cold range of the Himalayas ; during no season but the rains are they visible. Their cultivation, Captain Barnett writes, would repay any trouble to an enthusiastic person. This plant has been named by Dr. Wallich in his list of Nepal plants. The climate of Bengal is uncongenial to its growth.

This being the first Meeting after the completion of the different Reports by the Standing Committees on the different specimens of staple Agricultural produce submitted for the Society's Medals, the President called attention first to that of the Silk Committee. (*See Appendix, Report, No. 1.*)

Adverting to the very beautiful specimen of Silk submitted by Mr. Rose, who was awarded the Society's gold medal last year, and to whom the gold medal would be justly due, now for a second time, had he entered into more details, the President proposed, Colonel McLeod seconded, and it was resolved—"That Mr. Rose have the gold medal awarded to him, on his furnishing the requisite information to the satisfaction of the Silk Committee."

Award of the gold Medal of the Society to Mr. Balestier, American Consul at Singapore, for the best sample of Sugar.

But one specimen of Sugar had been sent in to compete for the Society's Medals. This was from Mr. Balestier, the American Consul at Singapore, whence Sugar for prizes by the Agricultural

and Horticultural Society of India is now excluded, as the Straits at present possess an Agricultural Society of their own; but by a special resolution of the Meeting held on the 12th September, 1838, Mr. Balestier was declared to be entitled to be a competitor for premia offered for the best samples of Sugar under existing conditions.

The Committee deem the sample submitted as a *strong-grained useful Sugar which would answer well for refining*; and that it might be classified "*as brown to good brown*," notwithstanding therefore only one sample was offered, the Committee recommended that the Society's gold medal should be presented to Mr. Balestier, as an encouragement to the manufacture of this useful Sugar.

Dr. Spry mentioned that the paper on the mode of preparation and other details of a practical character which accompanied this Sugar was deemed of so much value by the Committee of Papers, that it had been printed in the volume of the Transactions which had just appeared. (*See Appendix, Report, No. 2.*)

Nursery.—Forthcoming Distribution of Sugar-canes.

A report by the Nursery Committee next followed, wherein the Committee state that they had, during the previous month, visited the Society's Nursery at the Botanical Garden, and that in deference to the suggestion of several Members offered at the last Meeting, the period, for the annual distribution of canes, should commence on the 1st of October. Moreover the Report mentions, that the entire stock of the last year's growth had been distributed amounting in number to no fewer than forty-two thousand. That as a rule of guidance, in future every Member of the Society be permitted to claim 250 canes for his own use, and any number beyond that to be paid for at half an anna each.

The Committee allude particularly to the luxuriance of the Guinea Grass cultivation, and Mauritius black Bean, and also allude to the healthy and promising condition of "Nopalerie" with the late importation of Cacti with the Cochineal insect alive on them. The extent of the Nursery is increased by upwards of an acre since last year, and altogether amounts to six acres of land. Mr. Fergusson considered that Members so wishing, should be supplied with canes at an earlier period than the first of October, and it was decided that power should be given to the Committee to distribute them earlier if practicable. (*See Appendix, Report, No. 3.*)

Interchange between Asia and Europe of the Trees and Plants, the produce of each other's Soil.

The above reports having been disposed of, the President stated that he had much pleasure in calling the attention of the Society to a most important despatch from the Court of Directors which he held in his hand, connected with the interests of the empire of British India, and it was one which it required should be read in full to the Meeting.

To H. H. SPRY, Esq., M. D.

Secretary to the Agricultural and Horticultural Society, Genl. Dept.
SIR,

I am directed to transmit to you the accompanying copy of a letter, No. 1, of 1839, from the Hon'ble the Court of Directors in the Public Department, dated the 13th February, and of its enclosures on the subject of the interchange of vegetable productions of India and Europe, and to observe that the seeds and lists of plants referred to therein have not reached this Presidency. On their arrival the necessary steps will be taken to give effect to the Court's orders.

I am, Sir, your obedient Servant,

H. T. PRINSEP,

Secy. to the Govt. of India.

Council Chamber, the 22nd May, 1839.

PUBLIC DEPARTMENT.—No. 1 of 1839.

Our Governor General of India in Council.

Letter from General Department, dated 16th August, 1838.

Forwarding copy of Circular addressed to Officers in charge of Districts in or near the Himalayan range, relating to the collection of Plants for transmission Home, and calling attention to the interchange of the vegetable productions of India and Europe.

1. We are sensible of the importance of the subject to which in the letter under reply, you have directed our attention, and we have resolved on gradually furnishing you with the means of carrying on extensively, experiments for naturalizing in India, useful and desirable plants indigenous in other countries.

2. We have forwarded to the Government of Bombay, some varieties of Seeds (sixteen in number) with instructions to transmit them as rapidly as possible to the Superintendant of the Garden at Seharunpore. We shall continue at the proper seasons to send supplies of the other varieties, and it is our wish that the greatest care should be bestowed with a view to their naturalization for the benefit of the country. Our future supplies will consist of the seeds of Plants of more rare and curious character: some of those now forwarded are however highly important, either as affording articles of food or possessing medicinal virtues, and they will deserve all the attention that can be afforded to them.

3. We have also forwarded some Cotton seed from Naples, furnished by Dr. Royle, and which he thinks deserving of being made the subject of experiment.

4. With regard to the collection of seeds for transmission to this country, we are of opinion that the expediency of bearing in mind that the nature of the climate to which they are to be exposed should be impressed upon those to whom the task is to be committed. Dr. Lindley (copy of whose letter forms a number in the packet) has pointed out a very good test of capacity to bear an English climate in the occurrence or non-occurrence of the Deodar Cedar. His observations on the kinds of plants to which attention should principally be directed, appear to us especially valuable, and though we would not entirely prohibit the transmission of seeds of plants of a more delicate habit, it will be desirable that they should form a small proportion of those hereafter forwarded, and that they should be regarded as being of secondary importance.

5. In addition to the letter of Dr. Lindley, we enclose copy of two from Dr. Royle, which form a number in the packet.

We are, &c.

(Signed by the two Chairs and thirteen of the Court of Directors.)

London, 13th February, 1839.

PROFESSOR LINDLEY'S LETTER.

J. W. MELVILL, Esq. &c. &c. &c.

Horticultural Society of London, January 16, 1839.

SIR,

With reference to your letter of the 20th ult. and my acknowledgment of it of the 22nd, I beg now to state that I have very

carefully examined the seeds which have been received by the Honorable Court of Directors by the overland conveyance from Bombay, and that I shall with pleasure undertake the duty of distributing them, provided the Court approves of the manner in which I propose to do it.

The collection in question consists of about fifty packets of various sizes, containing seeds of plants inhabiting the hot plains of India : a part of these are species of no importance whatever, viz. *Bixa*, *Ovellana**, *Amaranthus*, *Santana**, *Gypsophila perfoliata*, *Stachytarpheta mutabilis* ; a few are medicinal plants, viz. *Butea frondosa*, *Cassia fistula*, *Cinchona excelsa*, *Mimosa Arabica*, *Suietenia febrifuga*, *Sterculia urens*, *Mimosa catechu*, and the remainder, with the exception of a bag of seeds of the Teak, are hot-house plants of no known use, but some of which are objects of ornament, and all of which have, I believe, been long since introduced from India to the gardens of this country. The whole appear to be in good condition. The quantity of each kind of seed is generally small, and in some instances will not bear to be divided : in others there is sufficient for several persons. But as there is little in the collection sufficiently rare or curious to interest those private individuals who are cultivators of store plants for the sake of their beauty, it does not appear to me desirable to offer them to any except public botanical institutions. I would therefore advise the Honorable Court to direct the distribution to be made as follows :

The seeds of medicinal plants to the Garden of the Society of Apothecaries of Chelsea.

Duplicates of the foregoing where any can be divided, and the remainder of the collection to be sent to the Botanic Gardens of Kew, Edinburgh, Glasgow, Cambridge and Oxford. After these institutions have been supplied there will still remain a small quantity of several kinds. Those might be useful in some of the British Colonies in the West Indies, and as a Society has lately been established in the Bermudas for the express purpose of improving the resources of those Islands, it might be advisable to place them in the hands of Lieut.-Colonel Reid of the Royal Engineers, who is now about to proceed to the Bermudas as Governor. In the event of a further surplus a small supply might be forwarded to the Bahamas, where the Government is also anxious to obtain the plants of other countries.

* Sic in MS.

It will be obvious from the statement already made, that no part of the present collection is of that degree of importance which could justify my recommending to the Hon'ble Court a further despatch of such seeds by the overland conveyance to this country. It appears to me that the introduction of plants which are mere objects of curiosity or only useful in distant Colonies should be left to the ordinary and private modes of communication, unless they are made a subject of special requisition. And as the species found in the tropical climates of India are all of this description, the general rule might be adopted of excluding all such plants from the overland despatch. There is no hope of their being naturalized or made in any way to conduce to public advantage in this country, for they are without exception uncultivable except in hot-houses. It is the more desirable to limit the supplies of seeds from India to those which come from the cold Provinces, because in those Districts there is a great abundance of species, the introduction of which is an object of national importance. The similarity of the climate of Great Britain and of many parts of the Himalayas is well known, and has been very particularly illustrated by Professor Royle, late Superintendent of the Hon'ble Company's Botanic Garden, Saharunpore, in his "Illustrations of the Botany of the Himalaya mountains," and consequently it has always been expected that the noble vegetation of the North of India might be successfully transferred to this country. That this opinion was well grounded has lately been proved by the effects of the severe winter, 1837-8, when a large proportion of all the Himalayan trees and other plants now in this country, exposed suddenly and under very unfavorable circumstances to a temperature of from $4\frac{1}{2}^{\circ}$ to $12\frac{1}{2}^{\circ}$ Fahr. resisted the intensity of the frost as well as our native species. The Deodar and other Himalayan Coniferous plants in particular are evidently as hardy as the Larch and the Spruce Fois; I would therefore advise that the authorities in India be directed to confine themselves to the transmission by the overland despatch of the ornamental and useful trees, and other plants inhabiting the districts in which the climate resembles that of England.

It is difficult at this distance to define with any precision the limits of such districts, but perhaps a good and certainly a very simple guide may be found in the Coniferous tribe, of the habits of all which we have sufficient information. The Deodar Cedar is hardy; the

Pinus longifolia not. It therefore might be directed that all those districts in which the Deodar occurs, or which have a colder climate, should generally furnish the supplies to be forwarded by the overland conveyance, that the species belonging to the *Pinus longifolia* regions should be either excluded or at least form a subordinate object, and that all plants from yet warmer districts should be entirely excluded.

In the Deodar region and colder localities are numerous species of birch, alder, chesnut, pyrus, sycamore, oak, &c. &c., valuable as timber trees; and a profusion of herbaceous plants, and bushes of striking beauty. Of course there is also an abundance of plants of no beauty nor any known use, all which should be omitted as they are only interesting to systematical Botanists who may be safely left to discover for themselves the best method of procuring them. It is unnecessary to give any more precise directions than this, except in the following cases. The Prangos Hay Plant, which furnishes valuable food for sheep in cold and barren situations, should be a special object of importation. The Rhubarbs called *Rheum Webbianum Spicatum*, and *Moorcraftianum*, are also much wanted, and it is most desirable that constant supplies should be forwarded of the seed of the Deodar Cedar, of the Hutton and Pindron firs, and of the Neoza Pine; none of which can be expected to bear cones in this country for a great many years, and which must therefore remain confined to the possession of a few persons, unless supplies of seed are forwarded in abundance from their native places. The nurserymen contrive indeed to multiply such species by grafting, but the plants so procured will probably be short-lived and are not suited to the purpose of forming woods.

With regard to the seeds which can be transmitted with the best hopes of success from England to India, for distribution to public officers and other residents in the Himalayan range of mountains, it is impossible for one who is personally unacquainted with the country to advise the Honorable Company with so much confidence as another person might who has himself resided in the Provinces referred to—I would therefore take the liberty of suggesting to the Honorable Court the propriety of obtaining a report upon the subject from Professor Royle, who was so long in the Himalaya, and who must be intimately acquainted with the wants and wishes of the residents there. In the mean while, as the Governor General has

been pleased to do me the honor of signifying his wish that I should be consulted upon the subject, I beg leave to lay before the Court the following general Memoranda.

There can be no doubt that the fine varieties of European fruit trees of all descriptions are desirable objects of export; but as the varieties cannot be propagated with certainty by seeds, and as trees are too bulky for the overland route, it is necessary to ascertain whether cuttings will travel with any prospect of success. This experiment is now in course of trial, a packet of small gooseberry, currant, and raspberry plants having been sent some weeks since to Simla at the particular desire of Lord Auckland, and the overland route having been used by permission of the Right Hon'ble the President of the Board of Commissioners for the Affairs of India. Should this experiment have, as I expect it will, a good result, there will then be no doubt that all our European fruit trees may be readily conveyed to the Himalaya mountains. But it will be previously necessary that the Saharunpur Garden should be provided with stocks, on which to bud or graft them; if such stocks do not already exist there, they should be provided; the wild pears, plums, quinces, and crabs of the country will answer this purpose as well as those of Europe.

European Vegetable seeds are in general objects of importance in India, where many of the races soon degenerate; but they would probably be thought too bulky for an overland despatch, except in a few cases.

England can, I fear, contribute in no great degree to the introduction of other plants to India, unless it were thought advantageous to procure our forest trees and natural shrubs—what seem the most desirable are those which inhabit countries warmer than our own, and which are too impatient of a Northern winter to produce seeds with us. In order to procure them, it would be necessary to communicate specially with persons stationed in many different places; perhaps the British Consular Agents could be employed for the purpose. Supposing that the Hon'ble Court thought fit to take such measures, it is difficult to estimate too highly the advantages that would accrue to the natives of India. Among the plants of which seeds should be procured, I would particularly name the following.

The Carob tree, *Cercis Siliquastrum*, a native of Syria, and the hottest parts of the South of Europe. This forms a large tree,

which bears in abundance pods filled with a nutritious substance. It is tenacious of life in a singular degree, and seeks its nourishment far from the surface of the ground, on which account it suffers little from the long continuance of drought. The pods are a common article of food in the countries where the tree is found, and are by some supposed to be the "locusts" on which St. John fed in the wilderness; they are sometimes sold in the fruiterer's shops of London. During the Peninsula war the pods were found of great value as food for cavalry horses, and I entertain no doubt that if the tree could be extensively introduced into the milder parts of Northern India it would render the famines we read of almost impossible. Seeds of this might be obtained conveniently in Egypt.

From the same country at the same time the Egyptian wheat, which succeeds in dry and sterile soil, and the *Cassia Acutifolia*, or Alexandrian Senna, might be procured.

Scammony is a drug which is consumed in large quantities in Medicine. All that comes to the market is obtained from Smyrna and Aleppo, and is so much adulterated as to be materially diminished in value: seeds of this plant could be procured from either place, along with the seeds of the valuable tobacco of Latakia.

Colonel Chesney found at Suvadia, at the mouth of the Orontes, Silk Mulberries of a finer quality than any which he had seen elsewhere: these could be easily procured. Cotton seeds should be procured from every country where the cotton of the west is of superior quality. Botanists know that the varieties of this plant are extremely numerous; and it is hardly to be doubted that however great the influence of climate may be upon the quality of this substance, special peculiarities in particular varieties are also deserving of the most careful investigation. The Hon'ble Company's Botanical Officers in India have, I presume, already made numerous reports of their experiments upon this subject, but still it is one of such great commercial importance that further investigation is most desirable on an extensive and varied scale.

The Olive, for which there is not a sufficient substitute in India must be obtained from the Olive districts of Italy, rather than from those of Spain.

From North America the Magnoliaceous plants are well worth introduction, not only for their beauty but because of their medicinal importance; the same part of the world might be made to supply the hickories, black walnuts, and other valuable forest trees, and

most especially the seeds of *Acer Saccharinum* or sugar maple, the sugar of which is of good quality, and which Dr. Royle thinks "might be a valuable gift to the people of the hills who are too poor to buy sugar." These and all other North American seeds should be bought at New York as early in the season as possible, and forwarded by a steamer. Upon their arrival in England they should be opened and carefully repacked according to their several natures, and immediately afterwards despatched to India. Such precautions are necessary, because in most cases the seeds of North American trees retain their vegetating principle for but a short time, and die very early as well as quickly.

With regard to the introduction to India of American and African medicinal plants, it would be necessary to make a special report upon that subject, in case the Hon'ble Court should be of opinion that it deserves to be considered; and it would embrace a large range of details which some of the officers of the Company will readily furnish.

I believe I have nothing further to add, except that from the great extent of the British Possessions in India, and the infinite modifications and combinations of soil and climate to be found within them, there can be no doubt whatever that almost every production of every climate, except the Arctic, may be so completely naturalized that where they are of any importance as objects of cultivation, they may be brought to all the perfection of which they are susceptible in other countries, provided proper skill and care are shewn in the selection of their situations.

I have the honor to be, Sir, your very obedient Servant,

(Signed) JOHN LINDLEY, *Vice Secretary*.

PROFESSOR ROYLE'S LETTER.

TO. J. C. MELVILLE, ESQ.

Secretary to the Hon'ble the Court of Directors of the East India Company.

SIR,

In acknowledging the receipt of your letter of the 20th ultimo, informing me that the Governor General of India, with a view to the introduction of the "useful and ornamental plants of England into India," had suggested to the Hon'ble the Court of Directors the propriety of my being consulted on the subject, allow me to express my gratification at the honor that has been done me. The subject is one

upon which I have frequently expressed and published my opinions, and feel well assured that great benefit would accrue to India by the judicious introduction into it of the various useful plants and even animals of different countries which are suited to its various climates and wide spread territories.

Engaged as is the Committee of Commerce and Agriculture of the Royal Asiatic Society in making some of the Natural Products of India known to the manufacturers of Europe, it will be highly gratifying to those interested in the prosperity of India, to know that the other great branch of the subject included in the attempt to improve the resources of India is to be prosecuted under the auspices of the Hon'ble the Court of Directors and of the Governor General of India. With the necessary attention to principles as well as to details, success in a great variety of instances is as certain as will be the eventual benefit, and the expence need be but small with two such establishments as the Hon'ble Company's Botanic Gardens at Calcutta and Saharunpore, situate at opposite extremities of the Great Gangetic Plains, with 1000 miles of intervening territory, and with considerable difference of climate.

The subject is not a new one, though it does not appear in recent times to have been prosecuted with the zeal it merits. But numerous useful plants have been introduced into India by the Calcutta Botanic Garden, and others by that at Saharunpore. More might have been introduced into the former from the new world, had there been more frequent direct communication with different parts of South America, Africa and India, and the Northern Garden might have acclimated many South of Europe and North American plants had it not been remote, both from Calcutta and Bombay.

But as different ages of the world have been memorable for the different routes of commerce, as well as for the interchange of the useful plants of different countries, so may the present time be distinguished by the more numerous introduction into India of useful plants, in consequence of the facilities afforded by Steam Navigation. The Romans, we know, introduced into Europe, many of our fruit trees from Armenia and Persia, as the peach, apricot, nectarine, quince, cherry, &c., while the Turks introduced plants into Constantinople, which thence spread over Europe, as the Lombardy poplar, thorn-apple, hyacinth and others; so the discovery of America and of the passage round the Cape of Good Hope introduced into India, many of the productions of the new world, as the tobacco,

capsicum, Indian corn and more recently the potatoe, now all so universally diffused, together with such fruits as the custard and pine apples, guava and papaya. But few plants have been introduced from the North into India. The peach and pomegranate must, no doubt, however, have travelled south, as probably did also the poppy, now so extensive an object of culture in the cold season of India. In the North of India, therefore, much may be done, and here Steam Navigation proceeding from the South of Europe to Bombay, and thence overland for seeds or up the Indus for plants, affords every desirable facility.

I, therefore, confine myself in the following observations to "the introduction into India of the useful and ornamental plants of England," begging leave, however, to substitute Europe for the latter, and including in my summary some of the plants of North America. On account, however, of the peculiarity of North of India climate, it is hardly possible to mention these without some notice of the Tropical plants, which may be, and are cultivated with them.

The Southern Province of India, including Bengal and the Lower Provinces, with much of the Peninsula, being of a tropical nature in climate with little cold weather, are chiefly suited for the cultivation of the plants, whether annuals or perennials of the intra-tropical islands and of the warm parts of America and Africa. As the tropic-like rainy season however extends over all India, its peculiarities of a tropical climate, heat and moisture with considerable uniformity of both, prevail over a great extent of territory for a few months in the year, and, therefore, in the most Northern parts we have the cultivation of rice, sorghum, Indian corn and other tropical grains in the very same fields where in the cold weather months, we have wheat and barley with peas and beans. This double climate and double culture it is necessary to notice in order to have a complete view of the nature of the country and climate of Northern India.

The mean temperature of the year at Saharunpore in 30° of North latitude, is about 73°, and of the months of

Jan.,	Feb.,	March,	April,	May,	June,	July,	Aug.,	Sept.,	Oct.,	Nov.,	Dec.
52,	55,	67,	78	85,	90,	85,	83,	79,	74,	64,	55,

From the middle of October to the middle of April, the various useful and ornamental plants of European climates may be successfully cultivated. The minimum of temperature in January is 25°, Fahr. and the maximum 105° in June.

The nursery which I established at Mussooree in the Himalayas at 6500 feet of elevation, though 50 miles distant, is very convenient for the introduction of European plants. Mussooree has a minimum of only 25°, and a maximum of 80° of Fahr. showing, that the equability is greater than in the neighbouring plains. The mean temperature is about 57° and of the months of

Jan.,	Feb.,	March,	April,	May,	June,	July,	Aug.,	Sept.,	Oct.,	Nov.,	Dec.
42,	45,	53,	59,	66,	67,	67,	66,	64,	57,	50,	45.

The season for cultivation in the Mussooree climate is from March to October. But between the Saharunpore garden and Mussooree nursery, a complete year of moderate climate may be obtained for the germination of seeds of temperate climates.

At Saharunpore in					At Mussooree in						
Nov.,	Dec.,	Jan.,	Feb.,	March,	April,	May,	June,	July,	Aug.,	Sept.,	Oct.
64,	55,	52,	55,	57,	59,	66,	67,	67,	66,	64,	57.

The climate having been proved favourable, little difficulty will be experienced with the soil or with irrigation as far as the experiments are concerned. The subsequent distribution of plants which have succeeded in the Dépôt Gardens must of course be determined by various circumstances, but the first should only be sent to favourable localities as failure is apt to discourage further attempts. The next subject of attention, and for which the preceding observations are only preparatory, is the kind of plants best suited to the northern parts of India and the Himalaya Mountains. Here we must be guided not only by the nature of the plants with respect to vicissitudes of temperature but also their usefulness—their annual or perennial nature, and in noticing the climate into which we wish to introduce them, take care to compare it with that from which they are to be introduced. The plants to be introduced may be considered with respect to their usefulness, or to their fitness for different kinds of climate. In the former case we should arrange them under the heads of food for the inhabitants, or fodder for their cattle. Such as are likely to be useful in any of the ordinary arts of life, or those which may afford products likely to become articles of commerce. Merely ornamental plants should not be neglected, nor those remarkable for their odour, as both gratify the senses and offer inducements to many to pay attention to gardening, when other more useful plants are necessarily introduced and with little additional expense. Fruit trees might appear to many as

not included among useful plants, but independent of their increasing the proportion of esculent matter in a country, they might become sources of considerable commerce between the plains and mountains of India, as is now the case with Cashmere.

There is another class of plants to which I paid considerable attention when in India, and which form the chief objects of my present duties, and that is medicinal plants. I was first requested to do so by the Medical Board of Bengal, and I cultivated many articles which were pronounced after trial in the General Hospital at Calcutta to be of the best quality. Dr. Falconer, the present able Superintendent of the Saharunpoor Botanic Garden, writes me that extract of henbane, which I first cultivated and manufactured, still continues to be supplied from the Saharunpoor Garden to the Hospital depôts. In the same situation, and in the Hill nursery many other medicinal plants now sent from this country, might there be successfully cultivated, and thus be not only more cheaply produced but also prescribed in a fresher state.

Keeping these several objects in view, I have thought it preferable for practicable purposes, that in the operations of horticulture and the selection of sites for the experiments, to arrange those plants I have as yet been able to think of, in three separate lists, according to the selection for which they are suited.

1. Annuals fit for cultivation in the plains of India in the cold weather and in the summer of the Himalayas.

2. Perennials probably suited to the plains of North Western India.

3. Perennials suitable to the Himalayas. Besides the plants mentioned in the respective lists, I have long thought it a very interesting subject of inquiry to ascertain by experiment whether the grains the people of India possess in common with Europe, are of the same degree of goodness and equally prolific, as for instance their wheat, barley, rape and mustard seeds, &c. Some of the plants which I have included in my lists, are intended to be useful for their products, which may become objects of commerce, but this involves another subject of inquiry, and that is whether the analogous substances which India naturally possesses, are superior or inferior in quality to those cultivated in other parts of the world.

It is probable that some of those enumerated in the accompanying lists may not be suited to the localities indicated, and a still greater number that might be suited to them, are, I am well aware, entirely

omitted. But this has been for want of time to give the subject the full consideration it deserves, but as this, to be successful to any great degree, must necessarily be carried on for a few years, I shall be happy to return to the subject if required, and point out the plants suited for cultivation in parts of India.

Though failure may attend some, I am well satisfied that success will attend the majority of instances, and feel the utmost confidence in stating that if the subject of the introduction of useful plants suited to the different parts of India, be continued, and the principles which should guide their attempts not be neglected, that very very beneficial results will in a few years be evident to all, and that if this be combined with an investigation, and publication to the manufacturing world, of the very varied natural products of India, an increase of the commerce and resources of that empire will ensue to an extent anticipated by few, but of which after long attention to the subject, I feel well assured, and hope to be able to prove to the sceptical.

I have the honor to be, Sir, your most obedient humble servant,

(Signed) J. FORBES ROYLE, M. D.

31st Dec. 1838, 62, Berners Street.

DEAR SIR,

In forwarding the accompanying seeds and specimens of fine Cotton grown in Naples, allow me to state that I think it is well suited for experiment, and will arrive in India at a very good time for ensuring a successful experiment. I^{*} do not myself think that the species is distinct from the *Upland Cotton* of the Americans; but the subject is so uncertain, that nothing but authentic specimens can enable one to give a decided opinion.

I hope these seeds may be sent by the Overland conveyance with the others, if the Court determine upon the measure. I forgot to mention in my letter, but which I stated to the gentleman who called on me from the India House, that I did not recommend all, or indeed any great proportion of the seeds and plants enumerated in my list to be sent at once, as they would only confuse, and prevent the experiment being carefully made. I would select the seeds of some of those useful as food—others as Medicinal articles, and some for their Commercial value. To the list I would add the common Spanish Chesnut, which seems well suited to Northern India, and the Himalayas, and would yield an additional article of food to the inhabitants

of the Mountains, who are sometimes forced to subsist upon acorns and bitter horse chesnuts.

I have, &c.

(Signed) J. F. ROYLE, M. D.

(True Copies)

H. T. PRINSEP, *Secretary to Government of India.*

At the conclusion of the reading of the above important communication, the assistance of the Society in aiding the intentions of the Home Government in so useful and philanthropic an undertaking, was fully accorded, and the despatch with its accompanying documents, were ordered to be printed in full, while Mr. Piddington gave notice of, and Mr. Robison seconded, the motion alluded to in the former part of the Proceedings.

As an instance of what may be done, Dr. Spry cited the *Cupulifera* family of plants, and stated that there were no fewer than twenty-two species of the oak common to the Himalayan range *that have never yet been seen in England*. Dr. Spry further mentioned, that it had occurred to him some time since to write to Colonel Lloyd at Darjeling, on the subject of these oaks, requesting that he would be so obliging as to have collected, as an abundant a supply of acorns of every sort as possible, and that if young trees could be forwarded at the commencement of the cold weather, they might be brought through the plains of Bengal with little risk and sent on board ship for conveyance to England.

A summary of the Society's endeavours to introduce the Superior kinds of Cotton into India.

The President next called attention to a Summary of what had been done by the Society, from its institution, to improve the Cotton cultivation of India, which the Secretary had prepared in answer to the communication read at the last Meeting, from the Bengal Chamber of Commerce.

Mr. Dearie recommended that as the subject was one equally interesting to the Glasgow Chamber of Commerce, and many other similar institutions in Great Britain, that the information embodied in this Summary should be printed in the form of a pamphlet, and it was at length determined that after transmitting a manuscript

copy to the Bengal Chamber of Commerce for the Manchester Chamber, that the Summary should be printed in the monthly Proceedings of the Society, and that one hundred and fifty copies extra, should also be printed for circulation throughout Great Britain.

Reply of the Bengal Government to the application relative to the discriminating duties on Tobacco and Rum.

TO H. H. SPRY, ESQ., M. D.

Secy. to the Agril. and Hortl. Society.

SIR,

I am directed by the Hon'ble the President in Council to acknowledge the receipt of your letter dated the 8th instant, and in reply to state that a reference has already been made by the Government to the Hon'ble the Court of Directors, at the instance of the Chamber of Commerce of Calcutta, pointing out the expediency of obtaining from the authorities in England an equalization of the duties levied on Tobacco, the growth of India, when imported into England with those fixed for the same article when produced in other Colonies in possession of Her Majesty.

2. With respect to Rum, the question is more complicated, but His Honor in Council will be glad to learn that the representation submitted by you to the Home Authorities will be effectual in obtaining an equalization of duties on this article also, when conveyed from India, not only to Europe but to all the Colonies and Possessions of the Crown of England. This subject has likewise been brought by the Government to the notice of the Home Authorities.

I have, &c.

(Signed) H. T. PRINSEP,

Secy. to the Govt. of India.

Council Chamber, May 15th, 1839.

Flora of Calcutta.

The Secretary next submitted to the Meeting a portion in manuscript of the Flora of Calcutta which had been forwarded to him, for presentation to the Society by Mr. Masters, late head gardener at the Hon'ble East India Company's Botanic Garden, Calcutta.

The title which Mr. Masters gives to the work is "Calcutta Flora, containing a synopsis of Plants indigenous to or cultivated in the

vicinity of Calcutta, arranged according to their natural families, with observations on the properties and manner of cultivating some of the most interesting,"—and in his letter to the Secretary, Mr. Masters states, that for a period of three years he has been employed, more or less, on the preparation of the work. Mr. Masters designed this only as the first part. The second to contain—

1st,—General observations on the cultivation of plants. 2nd,—Lists of the most approved fruit-bearing plants, with their scientific and local names, and a description of the most successful mode of propagation. 3rd,—Lists of ornamental flowering plants, habits, time of flowering, &c. 4th,—Lists of medicinal and spice-bearing plants, their propagation and culture. 5th,—Culinary vegetables, best modes of culture, &c. 6th,—Miscellaneous list, best suited to field culture. 7th,—Timber trees and such plants as yield articles of commercial value. 8th,—Domestic and commercial articles, the produce of Indian plants. 9th,—A Calendar of monthly operations; and 10th,—A copious index.

Mr. Masters states that omitting mosses, mushrooms, lichens and sea weed, of which he is not able to give any account, there are probably about 3972 species of plants in and about Calcutta. This Mr. Masters states, is a greater number than can at present be found in the Company's Garden. Mr. Masters' own catalogue when he left the Botanic Garden in September last year (1838) contained 1158 genera and 3609 species.

Just as Mr. Masters had finished page 44 he was suddenly interrupted by receiving an appointment, and states that he has therefore been compelled to give up all idea of completing the work at present. He hopes, however, to find leisure hereafter to carry his undertaking to completion.

Consignment of valuable Cashmere and other Fruit Trees from the Hon'ble Company's Garden at Saharunpore.

Dr. Falconer in a letter to the Secretary mentions having despatched from the Botanic Garden at Saharunpore on the 24th March "several very choice varieties of Cashmere apples and pears, and the *Muska Sahibee* and *Kishmishee* grapes, which are excellent and likely to prove new to Calcutta." The consignment in all amounts to 19 boxes containing 81 plants. The boat is daily expected.

Cotton and Indigo Seeds from Egypt.

A letter from Mr. Waghorn's House at Cairo was read intimating their gratification at being able to promote the interests of the Society, and their intention "to attend forthwith with respect to the cotton and indigo seed," required by the Society.

*Acclimatation of the Floriculture of Europe in the valley of Deyrah—
an improved mode of protecting Sugar-cane from the ravages of
ants—Tea plantation at Khote.*

A communication, through Dr. Wallich, from Lieut. Kirke, Resident at Deyrah, was next read to the Meeting. The letter was one of great interest as setting forth the success which has attended Lieut. Kirke's efforts to introduce the European cultures into the congenial climate of the sub-Himalayan range, and affords a convincing proof of the capability of our Northern soil for naturalizing the productions of the Western world. Lieut. Kirke states, that he has white broccoli growing in his grounds, measuring 14 inches in diameter, and as white as those in England. The parsnip thrives in great perfection, as well as the mangul wurzel and numerous other things in the vegetable way, the seed from which Lieut. Kirke hopes to be able soon to send to the Society. The whole of the American seeds grew beautifully, and Lieut. Kirke considers them to be certainly superior to the Cape seeds. Hops are growing famously and their success is certain.

Among the items in this interesting communication is the announcement, that the sugar-cane has been successfully grown by dipping each piece of cane into common whitewash and a little quick lime sprinkled over the surface in the trenches. By pursuing this method, Lieut. Kirke states, that every eye grew, and a white-ant has not yet attacked them. The day before writing his letter Lieut. Kirke had the curiosity to examine an entire begah and he found that not a single slip had been touched, although the plant had been in the ground for upwards of six weeks. In the same land, last year not a single cane could be grown. Canes dipped into very thick whitewash on Christmas-day, appeared above ground in six weeks from that time, and not a single cane was touched by white-ants. Other experiments Lieut. Kirke mentions having tried to protect

canes from the ravages of the white ants, but nothing he has ever tried has ever proved so successful as the whitewash, and he desires particularly that the fact may be brought to the notice of the Members of the Agricultural and Horticultural Society.

Lieut. Kirke mentions that the best of all canes is "Sleeman's Mauritius Cane." The strength of the juice from Sleeman's, Colvin's and indigenous cane was tried by the Saccharometer, and that obtained from Sleeman's cane, had $2\frac{1}{2}$ degrees more saccharine matter than the native, and 4 degrees more than Colvin's, besides which Lieut. Kirke states that the latter (Colvin's) does not ripen well in the Deyrah valley.

Lieut. Kirke mentions that the Tea plantations at Khote are thriving splendidly; that a great quantity of seed has been sown this year at the plantation, while that sown at Churjeree and Barcher have failed. In four years Lieut. Kirke thinks that the cultivation could be made to pay a handsome revenue. The place moreover is calculated for the Hop cultivation.

In the Floricultural department Lieut. Kirke has his garden stocked with numerous very beautiful things, such as double anemones, double ranunculus, both in full bloom and of every colour, double dahlias of 30 or 40 different sorts, double carnations, jonquills, daffodils, hyacinths, both double and single, proteas, and calendrias, all of which Lieut. Kirke thinks very few, if any, in this country have besides himself in such perfection. The heart's-ease are superb, skyzanthus seed, eschscholtzia californica and crocca are to be sent down shortly, and there are *three maunds of dahlia roots lying in the verandah of Lieut. Kirke's house, ready for any member who wishes for them on application to that gentleman.*

For all the foregoing presents and communications the thanks of the Society were awarded.

HENRY H. SPRY, M. D., *Secretary.*

APPENDIX.

No. 1.

Report of the Silk Committee on the Samples of Silk, submitted by Individuals to compete for the prizes of the Society.

PRESENT.—MESSRS. C. K. Robison, Wm. Storm, R. Watson, D. W. H. Speed, G. T. F. Speed and Dr. Spry.

The Committee met, in accordance with arrangements previously made, on Saturday the 18th instant ;—The letters of competition, with seals unbroken, were laid on the bags to which they severally had reference ;—the parcels being opened in the presence of the Committee.

Two skeins of each parcel were taken out and carefully inspected. The whole having been examined, the Committee resolved to postpone their decision till Monday morning, May the 20th, when Mr. Watson proposed to ask the assistance of Mr. Laidlay in awarding the prizes.

On Monday morning, May the 20th, the Committee re-assembled.

PRESENT.—MESSRS. R. Watson, W. Storm, D. W. H. Speed, and Dr. Spry.

VISITOR.—Mr. J. W. Laidlay.

A careful inspection of each sample was again made, and those deemed the most deserving, were set aside. This being done, the letters were opened,—when it was found that the sample sent in by Mr. W. G. Rose of Ramnaghur Factory, in the District of Moorshedabad, was the best, but the letter which accompanied it, entered into few of the details which are required by the 4th Rule of the conditions, and therefore, the Committee do not feel themselves justified in recommending that the award of the gold medal should be made.

The Committee are aware that last year the medal was awarded to Mr. Rose on no better information than that which he has furnished on the present occasion,—but that was the first exhibition for prizes, on the new system, that had been held by the Society, and in consequence, a rigid adherence to the published

conditions was not deemed essentially requisite, as it was thought, that from the novelty of the plan, the public might not exactly understand what was required; now, however, the Committee consider, that whatever the nature of the sample of Silk may be, which is sent in, unless the 3rd and 4th Rules of the conditions be carefully adhered to, the Society would not be justified in giving away their medals;—the object sought, namely, the *quality of the soil*, as well as the *mode of cultivation, manufacture and cost of production*, being intended for the good of the public.

The honorary distinction of having furnished the best sample two years following, the latter year among six competitors, will weigh with Mr. Rose, the Committee have no doubt, equally as if he had been awarded a second gold medal.

It must be mentioned, however, that with regard to all the samples sent in, not one of the competitors had complied in full with the published conditions, which are required by the Society before the medals can be awarded, and from the ordinary character of the samples of the remaining five candidates, the Committee did not consider them of sufficiently superior character to merit any medal from the Society.

Next to that of Mr. Rose, the Committee consider Mr. F. W. Campbell's, as the best parcel, but for the want of the information just alluded to, the Committee make no award.

WM. STORM,
ROB. WATSON,
HENRY H. SPRY, M. D.
D. W. H. SPEED,
G. T. F. SPEED.

Agri. and Hortl. Society's Rooms,
May 21, 1839.

Undoubtedly and strictly speaking the Committee are *legitimately* justified in refusing the award of the gold medal to Mr. Rose, because notwithstanding the excellence and acceptableness of his specimen, he has failed to fulfil in most important particulars that which is so valuable to the Society, and without it, his specimens are of little value indeed.

The Committee would appear to have the strongest and the least exceptionable grounds for refusing to award the medals of merit to any of the other five competitors because the parties have failed in *all cases*, viz.

I speak here off the Book, the Rules not being before me, and I suppose only from the wording of the above letter that the Committee use their discretion.

1st. To supply specimens of qualities sufficiently good to merit, in the opinion of the Committee, the medal of reward.

2nd. To furnish in other respects the particulars which are comprehended in the published conditions.

If it can be shewn that Mr. Rose was in any wise aware of the irregularity, informality and defect of his report of the previous season, I think he has then debarred himself; but if not, the very act of having rewarded him with the medal unaccompanied with remark on his defective report, has naturally left him with the impression that it was held of no material consequence. Thus the Society having been unwittingly in some measure accessory to the omission, I think it would be hard on Mr. Rose, and perhaps impolitic as respects the interests of the Society in the main, now to make the refusal absolute. On the score of poverty the Society has nothing now to restrain it, but its wealth or poverty does not much concern any opinion on the merits of the case. It is its duty to act justly, and its policy to act liberally, and also indulgently when it is in some measure itself mixed up with the error committed and of which it complains, and especially when there are some main grounds for extending its grace.

Under all the circumstances I would recommend that an explanatory letter be written to Mr. Rose, (having the authority of a general meeting if this be needful,) to state the circumstances as here displayed, and to require from him an amended report as respects the defects of his present one, and that on this being supplied, unless he shall shew good and sufficient cause for the contrary, and not otherwise, the award of the medal now held in suspense shall be conferred upon him.

Perhaps this measure can only be resolved by a general meeting, but I beg to suggest that our committee propose it then, as the best measure under all the consideration given to the case.

The Committee will further do well to remind the Agricultural Society of the importance of their making it duly known, by especial advertisement and at a suitable time, that in future no premiums will be awarded unless its printed and published conditions as to the

required reports be fully and particularly complied with by all candidates and competitors.

(Signed) J. WILLIS.

I agree. „ W. B. O'SHAUGHNESSY.

No. 2.

Report of the Sugar Committee.

At a Meeting of the Sugar Committee convened on Thursday the 30th May, 1839, for the purpose of reporting on samples of sugar sent in for competition agreeably to advertisement, and in accordance with a resolution passed at a General Meeting on 14th November, 1838.

PRESENT.—Messrs. Storm, Allan, Muller and Spry.

But one specimen of sugar had been sent in to compete for the Society's medals. This was from Mr. Balestier the American consul at Singapore, whence sugar for prizes is now excluded, as the Straits at present possess an Agricultural Society of their own ; but, by a special resolution of the meeting held on the 12th September, 1838, Mr. Balestier was declared "to be entitled to be a competitor for premia offered for the best samples of sugar under *existing conditions*."

The Committee consider the sample submitted by Mr. Balestier as a strong-grained useful sugar, which would answer well for refining; and that it might be classified as "brown to good brown."

The Committee are disposed, notwithstanding there is only one sample offered for competition, that, the Gold medal should be given to Mr. Balestier as an encouragement for the manufacture of this useful sugar.

WM. STORM,
A. MULLER,
J. ALLAN,
D. TAGORE,
G. U. ADAM,
W. F. FERGUSSON,
DAVID HARE.

No. 3.

*Proceedings of the Garden Committee.**Saturday, May 18, 1839.*

A meeting of the Garden Committee was held on the above date at the Botanical Garden.

PRESENT.—Messrs. Wallich, Leach, Storm, Gibbon and Spry.

The Committee proceeded to visit the Society's nursery cane plantation and found the same in a forward state of vegetation.

The entire stock of last year's canes had been disposed of to the public. The ratoon crop is now in a flourishing condition and looks remarkably well.

Adverting to the difference expressed by members of the Society as to the most preferable time for distribution, the Committee beg to recommend, that an earlier date be selected for the approaching grant, and would suggest that notice be forthwith publicly given to all persons desirous of obtaining canes from the Society's nursery to make an early application, and that the 1st of October next be the day fixed on for commencing the season of distribution.

That as a rule of guidance in the method to be adopted in the allotment of the canes in future, all members of the Society be permitted to claim two hundred and fifty for their *own use*; but all beyond that number to be paid for at the rate of half an anna per cane. That the public at large be allowed, on registering their names with the Secretary, to have canes from the Society's nursery at the charge of half an anna or six pie per cane. With regard to the collection of grafts and seedlings at the nursery, the Committee desire to mention, that the smallness of the stock is inadequate to meet any general demand from members, who do not seem to be aware that the Society do not pretend to keep up a nursery of fruit trees to meet any extensive requisition; in lieu thereof, the Committee desire to make known the intimation of Dr. Wallich, superintendent of the Botanic Garden; namely, that any member requiring to be furnished with a supply of shrubs and fruit trees by making application to him will have such application registered and complied with as far as practicable, according to existing usage.

The Committee have great satisfaction in noticing the luxuriant manner in which the Guinea Grass and Mauritius black beans are flourishing. Besides the foregoing, the Committee were gratified to observe the healthy and promising condition of the "Nopalarie"

which has been established at the nursery since the death of the late Secretary, and took especial note of the late importation of Cacti from Bourbon with the Cochineal insect alive on them. The Committee regret however to remark that the number of insects are diminished by death since their arrival in Bengal: but as every care and attention is paid by Dr. Wallich to the preservation of the plants by the erection of temporary sheds to guard against the violence of the elements, the Committee are not without a hope that the remaining insects may be spared.

On reviewing the extent of the past year's labour the Committee find that the ground occupied by cane cultivation during this time, was about five acres (15 beegahs) and that upwards of forty-two thousand canes were distributed. This quantity of ground remains in cultivation as a ratoon crop, and in addition to it a further accession has taken place of three beegahs, which will enable the Society to supply a still greater quantity than has hitherto been done.

A note was read from Dr. Wallich to the Secretary, dated March 21, 1839, stating that he had for the present dispensed with the overseer's services at the nursery, which effected a saving to the Society of 40 rupees a month, but that it would be necessary to re-engage his services at the commencement of the cutting season. The present establishment consists of 17 men at a charge of 60 Rs. per month.

Finally, a letter from Dr. Falconer, Superintendent of the Honorable Company's Botanical Garden at Saharunpore, was read, containing a list of fruit trees on their way down the Ganges; and at its conclusion, it was determined that as the extent of the consignment required the best attention of the Committee, the Members should reassemble on receiving intimation from the Secretary of the arrival of the plants.

(Signed)

N. WALLICH,
WM. STORM,
WM. F. GIBBON,
THOS. LEACH,
CHAS. HUFFNAGLE,
HENRY H. SPRY, M. D.

JULY 10, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Rooms, Town Hall, on Wednesday, the 10th July, 1839.

(Fifteen Members Present.)

C. K. Robison, Esq. Vice President, on taking the Chair announced the regret of the Hon'ble the President at being unable from other business to attend.

Dr. Wallich informed the Meeting that he had, for the day, undertaken to officiate for the Secretary who was prevented from being in his place by indisposition.

The Proceedings of the last Meeting were then read and confirmed.

MEMBERS ELECTED.

The Gentlemen proposed at the last Meeting were elected Members of the Society; viz.

Messrs. H. T. Stewart, J. W. Laidlay, A. K. Lindesay, H. Falconer, M. D., Arch. Sconce, L. J. H. Grey, R. C. Halkett and Lieut. Col. Presgrave.

FOR ELECTION.

The names of the following gentlemen were read as candidates for election at the next Meeting:—

Colonel Thomas Fiddes (Town Major)—proposed by Dr. Spry, seconded by Mr. C. K. Robison.

H. C. Halkett, Esq. C. S. (Jessore)—proposed by Mr. W. H. L. Rainey, seconded by Dr. Spry.

F. Lowth, Esq. C. S. (Jessore)—proposed by Mr. W. H. L. Rainey, seconded by Dr. Spry.

F. Courjon, Esq. of Comillah—proposed by Mr. John Allan, seconded by Mr. W. Storm.

Lieut. J. Eliot, (Artillery, Akyab)—proposed by Dr. E. W. Claributt, seconded by Dr. Spry.

W. P. Downing, Esq.—proposed by Dr. Spry, seconded by Dr. Wallich.

A. S. Annand, Esq. (Magistrate and Collector at Tipperah)—proposed by Mr. Charles Cardew, seconded by Dr. Spry.

Frederick A. Lushington, Esq. (Joint Magistrate and Deputy Collector at Moorshedabad)—proposed by Mr. Alexander Beattie, seconded by Mr. C. J. Richards.

PRESENTATIONS TO THE SOCIETY.

LIBRARY.

Two copies of the second volume of the Farmer's Cabinet—*Presented by the Philadelphia Society for promoting Agriculture.*

MUSEUM AND NURSERY.

A few varieties of Maize, and a small quantity of Grass and other Seeds—*Presented by the Philadelphia Society for promoting Agriculture.*

A small quantity of Pernambuco, Peruvian and Fernando Po Cotton seed, grown at the Palmasdecah Plantation, near Sook Saugor—*Presented by Mr. L. Quantin.*

Two grafts of Orange trees and two grafts of Pear trees—*Presented by Nuwaub Tohowerjunj.*

A fresh supply of Cactus plant with Cochineal from the Isle of Bourbon—*Presented by Mons. Richard*, Superintendent of the Botanical Garden at that Island.

Note.—Dr. Wallich stated that the *Plant* had arrived in excellent condition, but he regretted to say there were very few insects alive on them. He begged of members who might have any practical knowledge of the treatment of the insect to assist him with their advice.

MOTION OF WHICH NOTICE WAS GIVEN AT THE LAST MEETING.

The motion proposed at the last Meeting by Mr. Piddington, seconded by Mr. Robison,—That with a view of aiding the labours of

those scientific gentlemen at home who have interested themselves on the subject of an interchange of plants between Asia and Europe, a Committee be formed for the purpose of suggesting such plants and trees as may be thought desirable for introduction into India, and those that can be furnished in return,—was the subject which first engaged the attention of the Meeting.

Mr Piddington in addressing the Meeting, as the proposer of the above motion, stated that he did not consider it necessary for him to say much on the subject,—as the object to which it had reference was one, the utility of which, could not fail to be recognized by every member of the Society; yet he begged to call the attention of the meeting to a few staple articles of commerce, among many others that might be named if time permitted, which appeared to him to require some slight comment. In the first place, he would allude to that great staple of Indian Commerce, Indigo. We had now for many years been cultivating the Asiatic species, without endeavouring to discover whether the Indigos of other countries might not possess equal if not superior qualities. Mr. Piddington then mentioned the African and American varieties as being superior both for production and for manufacturing purposes, and instanced the Egyptian Indigo and that of the Caraccas,—the latter, he had found, by experiments on a large scale, to be a species of Indigo from which it is scarcely possible to make a bad colour; and reckoning the loss on a crop, on account of its inferiority in colour, at the moderate rate of 5 per cent. what a saving would be effected by the culture of that species, which would afford a good colour. Mr. Piddington then went into detail to prove that the plant that is now so largely cultivated in India, is not, by any means the best variety.

The several sorts of Oil seeds were next alluded to by Mr. Piddington. The African Sesamum, which gives a greater produce of oil than the common black sort :—the White Sesamum of Southern India, and several other varieties of this highly useful product, which might be successfully introduced.

The trees producing Gums of several qualities were then adverted to. In the vast tracts throughout India, in many parts the Babool only grew;—now if we could introduce those trees which produce the Gum Senegal, Gum Arabic, &c. &c. which are so well known to give a price in the market very much beyond that obtained for the Gums now cultivated, what great advantages would be conferred on the country! The subject of an interchange of plants

between Asia and other parts of the world was one which had engaged the attention of the Society many years ago, and Mr. Piddington reminded the Members of the Circular which was issued in the year 1832 regarding it. In addition to the foregoing, Mr. Piddington alluded to several other articles of commercial value, and stated in conclusion, that the Society would doubtless have it in its power to aid materially those gentlemen at home who had undertaken the inquiry, and he would therefore beg to propose that a Committee be appointed for that purpose.

The meeting having taken the subject into consideration, agreed that the following gentlemen be now requested to form themselves into a Committee, with power to add to their number :—Drs. Wallich and O'Shaughnessy, Baboo Ramcomul Sein, Major Carter, Messrs. Storm, Robison, Willis, Watson, Piddington, D. W. H. Speed, Johnson, Cowie and Dr. Spry.

NOTICE OF MOTION.

Proposed by Major Carter, seconded by Mr. Piddington :—

“ That the sum of five hundred rupees be assigned for obtaining from abroad a quantity of Seed Corn, for distribution or sale. The amount of each description to be determined by the Committee or Society.”

REPORT OF THE COTTON COMMITTEE.

Dr. Wallich read to the Meeting a report drawn up by the Cotton Committee on the only samples of Cotton, which had been submitted to compete for the Medals of the Society.—(*See Appendix.*)

In connection with this Report, and with reference to the wish of the Members of the Committee, for more detailed information on the mode of culture, &c. of the trees, from which the above samples of Cotton had been produced,—the following extract of a letter from Mr. Quantin, dated from Palmasdeeah Plantation near Sook Saugor, in reply to the application of the Secretary, was brought to the notice of the Meeting.

“ I have only one Peruvian Cotton tree, which was 21 feet high, which gave me 360 pods, and had not the storm blown down the tree, I would have collected about 100 pods more. As the tree is blown down, I have cut off all the branches and left the stalk only, which is thriving well; the soil is mixed, a little sandy; the trees I

had left to chance, only watered several times during the severity of the weather, March, April, and May. The sample ticketed "*Peruvian Cotton, second year's growth,*" *is the produce of the former year's trees not cut down.*" Mr. Quantin proposes extending the cultivation.

AGRICULTURAL CAPABILITIES OF THE PROVINCE OF MERGUI.

Dr. Wallich read to the Meeting an interesting communication from Dr. Helfer, dated Mergui, May 28th, to the address of the Secretary. After offering his services to the Society in any way they may be available in that quarter, Dr. Helfer adds,—

"The Tenasserim Provinces being the Southern and Eastern-most of the Presidency of Bengal, participate much more of the nature of the Malay countries and of Indo-China at the same time, than of India proper, and have consequently many productions peculiar to them not to be found in the rest of India. The Southern parts, and chiefly Mergui province must, according to its latitude, be already included within the cyclus of intertropical countries, the violence of the monsoon being already broken, and a more equally distributed rain approaching to a uniform series of seasons, assimilating it to the climate of Penang and Singapore.

"Hence also the productions of these countries promise to thrive well in these parts, and I have instituted an experimental introduction of the Clove and Nutmeg Tree. Should these succeed, they could with great probability from here be transported to a more northern latitude, gradual acclimatization being the great secret in the introduction of foreign vegetable productions. In this way for instance, the Date tree has been gradually brought from the Deserts of Arabia into the secluded valleys of Geneva where it now blossoms and produces fruit.

"And so we may hope that the valuable Spices of the Molluccas, after having made their first stage at Penang, and their second at Mergui, their third at Moulmein, may finally be introduced into Bengal.

"The true Cajeput Oil tree is growing in abundance in these parts; should the Society wish any number of seedlings for introduction in Bengal, I will be happy to send them.

“As Coffee thrives beautifully in these Provinces a supply of *sprouting* Coffee seeds would be highly desirable for distribution among the Natives. All the Coffee hitherto sent *dry* proved a failure—the power of germination was extinct.”

Experimental Plantation near Amherst Town.—Intended Introduction of Chinese Labourers into the Tenasserim Provinces.

Mr. Blundell, Commissioner in the Tenasserim Provinces, in a letter dated Maulmain, 10th June, acknowledges the receipt of a consignment of Seeds forwarded by the Society in April last:—“Every thing,” writes Mr. Blundell, “reached me in perfect safety; the Coffee Plants in especial fine order. The Cotton Seeds have, I regret to say, nearly all proved bad, with the exception of the Malta Cotton. These and Maize are the only seeds that have yet been put in the ground, the other being reserved till the strength of the Monsoon is passed. My friend Mr. Riley has taken charge of all these Seeds and Plants at his Establishment near Amherst Town, and he will duly report the result of his experiments. I heartily wish we had a few more individuals here to engage in Agricultural pursuits, but doubtless if Mr. Riley succeeds, others will soon follow. One great advantage enjoyed here is the adaptation of the climate to the European constitution;—land is abundant and of every description; but on the other hand the price of labour is enormous, owing to our very scanty population. Mr. Riley proposes to obviate this by the introduction of Chinese labourers from the Straits.”

Report of the Progress made in the Garden of the Branch Agricultural Society at Saugor.

Capt. White, Secretary to the Branch Agricultural Society, lately established at Saugor, Central India, gives the following interesting particulars relative to the progress of their institution:—“A European has been employed as a Superintendant, and to keep a diary of proceedings, as well as of the productions of the Garden. The Coffee plants, of which there are a great number, thrive exceedingly well and bear berries, although this year not in such profusion as in general. We are anxious to know, whether the berries have to undergo any particular process in the drying before being

burnt for use. The Otaheite Sugar Canes are large and luxuriant, and a small quantity of goor has been made therefrom by way of experiment. The Cotton is very productive ; the Georgia has not succeeded so well as anticipated ; this probably may be owing to their having been planted in the wrong season. The Arracan Tobacco, will, I have no doubt, be speedily acclimated, and become very fine ; at present the leaf is small. The Rhubarb seeds from Dr. Wallich have been sown and vegetated, but I much fear the plants will not thrive, having been put into the ground only last month, and I should think the proper period to be the commencement of the cold season (October.)” With regard to Horticultural experiments, Captain White adds—“The vegetable productions have not been noted in the Society’s Garden ; in that of Sir Thomas Anburey’s several very large Cabbages from Cape seed (Drum-head) were produced ; the largest weighed 19 lbs., the stock cut short and without a single green leaf : in circumference it was 39 inches. The Tomatas are the largest I have ever seen, or heard of : one weighed 42 Co.’s Rs., and was 17 inches in circumference. The Leeks have been most carefully cultivated, and are not only in great abundance but very fine ; the weight $1\frac{1}{2}$ lbs., circumference 7 inches, and length 13 inches, entirely white. The Lettuces of every description exceedingly large ; a Coss Lettuce weighed nearly $1\frac{1}{2}$ lbs. divested of the green leaves. Parsnips of a very large size, are still in the General’s Garden ; the seed did not vegetate very freely, but what did come up have thriven wonderfully well, and some have just shewn the appearance of going to seed. The Scorzonaira I expect next year will be very fine ; one small bed has seeded very freely, and the few roots we tasted were exceedingly good, resembling very much in flavor to Artichoke bottoms. Of the American Seeds, the Squash, Pumpkin, Mangul Wurzel and the different kinds of Radishes have vegetated ; the bush and long green Squash are very luxuriant, and appear to be a very delicate and delicious vegetable.”

Climate and Capabilities of the Province of Chota Nagpore.

The next communication read to the Meeting, was one from Major Steel, in charge of the Ramghur Local Battalion. This gentleman, in a letter dated Dorunda, Chota Nagpore, May the 13th, thus expresses himself : “The climate is cool and agreeable

during the night; in the day an occasional hot wind prevails, but never long,—the winds have been too variable. The people are an honest, simple race, but as superior in integrity to the other inhabitants I have met with as possible. Any thing might be made of them, and I feel convinced the soil contains great practicabilities. If you can supply me with some Cotton, Coffee and Tobacco, I shall be most happy to distribute them to some of the most intelligent Zemindars, so as to be able to give you an account of the results, as well as some of the best Sugar Canes that you have at your disposal." "The capabilities of these Provinces appear to me to require only to be proved to render it a place of much more consequence than it has hitherto attained in the eyes of the commercial community."

A large supply of different kinds of seeds has been forwarded to Major Steel.

Great Extension of Cane Culture in the Districts of Azimghur, Benares and Jaunpore.

Dr. Lindesay (Surgeon at Benares, in a letter dated May 15, speaks most highly of the flourishing state and rapid increase in the culture of Cane in that neighbourhood:—"The Sugar Cultivation," writes Dr. Lindesay, "is extending every year. I drove over from Jaunpore yesterday, and was much struck with the great spread of thriving young Cane. An intelligent planter thinks that this year will nearly double the last, (so quickly is it progressing.) This year there was a fall of rain at an unusual time (February) which while it destroyed the wheat and barley enabled the cultivators to plough and plant Cane without irrigating."

Expected Arrival of Seeds and Plants from England.

Dr. Wallich brought to the notice of Members the receipt of a letter by the last Overland Mail, from Messrs. Noble and Sons, Seedsmen and Florists;—mentioning the despatch by the "Malcolm" at the latter end of March last, of a large consignment of Garden seeds and Fruit trees. As the "Malcolm" is now shortly expected, the arrival of these seeds so early in the season will admit of a fair trial being given to them.

As in some measure connected with the foregoing, Dr. Wallich read a letter from an old correspondent and well-wisher of the Society, Mr. J. J. Dixwell of Boston. This gentleman promises to use his best endeavours to transmit by the first favorable opportunity, a large quantity of American Maizé of different varieties, a large assortment of Grains, Grasses and other Agricultural Seeds, for the use of the Society. Mr. Dixwell adds—"We have lately introduced a new Potatoe of wonderful prolificness, and coming to perfection under an uncommonly high temperature. All the late crops are too old to send you, but I will endeavour to forward some of the first of the next crop."

Establishment of an Experimental Garden at Kishnaghur.

Mr. Steer, the Magistrate of Kishnaghur, in letters to the address of the Secretary, intimates the formation of an experimental Garden at that Station. Mr. Steer mentions that it was his intention in the first instance to have endeavoured to have established a Branch Society, he was however unable to carry his wishes into effect; "but," adds Mr. Steer,—“the natives who put their names down as Subscribers, have expressed such disappointment in the failure of the proposition that I have determined to gratify them with a garden of some sort. It will be too contemptible a concern to be termed a Branch Society; we must, therefore, be independent of you in the first instance. The object of our Society will not be so much the cultivation of European Vegetables, Flowers, &c. as the improvement of those staple articles, Tobacco, Sugar and Cotton, of which there is a large Cultivation in this Zillah.”

Dr. Wallich stated that the Secretary had despatched a large quantity of Cotton, Tobacco, &c. seeds, and also a boat load of fruit trees to Mr. Steer, to assist in stocking this newly formed Garden.

Proposed Formation of an Experimental Garden near the City of Allahabad.

The next letter that was read was from Mr. R. Montgomery, Magistrate at Allahabad, in which that gentleman intimates his intention of establishing an experimental garden on a piece of land belonging to the Government, close to the Station, and requests to be furnished with an assortment of such seeds as are at present

available. With respect to the produce of a supply of Cotton seeds received last year from the Society, Mr. Montgomery mentions that "the Cotton trees seemed to flourish very well, but did not flower till January, and produced Cotton in the end of March, whilst the Cotton of this part of the Country is sown in the end of June, and the produce collected in November. Perhaps I was too late in sowing it, which I believe was the case ;—of the five kinds of Cotton seeds sent me, only three kinds, viz. the Bourbon, Seychelles and Sea Island came to perfection, and the *Bourbon* succeeded the best of all. I will have a little of it put in parcels and sent for the inspection of the Society."

In compliance with the request conveyed at the close of this communication, Dr. Wallich mentioned that a liberal supply of Cotton and other Agricultural Seeds had been forwarded to Mr. Montgomery by the last steamer.

With reference to the resolution passed at the last Meeting, regarding the award of the Society's Gold Medal to Mr. W. G. Rose for the best specimen of Silk, "on his furnishing the requisite information to the satisfaction of the Silk Committee," Dr. Wallich drew attention to a letter which had been lately received from Mr. Rose, in which that gentleman expresses his readiness to afford every information on the mode of cultivation, manufacture, cost of production, &c. of the staple alluded to, as soon as a little leisure time will admit of his doing so.

Letters were read from the Secretaries of the American Philosophical Society at Philadelphia, and from the Philadelphia Society for promoting Agriculture, conveying the thanks of their respective Institutions for the donation of vols. 3 to 5 of the Transactions of the Agricultural and Horticultural Society of India.

For all the foregoing presents and communications, the thanks of the Society were awarded.

HENRY H. SPRY, M. D., *Secretary.*

APPENDIX.

Report of the Cotton Committee.

Report of the Cotton Committee on Competition Samples of Peruvian Cotton submitted for the Society's Prizes.

The Committee consider the two Samples of Cotton, submitted by Mr. Quantin, for their judgment and labelled "Peruvian Cotton 1st year's crop sown in June 1838," and "Peruvian Cotton, 2nd year's crop," to be undeserving of either of the Society's Medals;—1st, owing to the smallness of the quantity furnished, and, 2ndly, on the ground of there being no sufficient report in accompaniment as to its production.

The specimen of "Peruvian Cotton sown in June, 1833, is *bad in colour* and of *bad quality*."

The specimen of "Peruvian Cotton, 2nd year's crop," is of *good colour* and *good quality*; so good indeed as to deserve particular inquiry. It is quite equal to any imported into England from Peru or the coast of America.

The sample would without doubt have been entitled to a Medal had the grower produced a sufficient quantity, and accompanied it with the full and particular Report required by the published conditions of the Agricultural Society.

(Signed) JOS. WILLIS,
D. B. SYERS,
CHAS. HUFFNAGLE,
WM. STORM,
H. H. SPRY, M. D.

AUGUST 8, 1839.

Agricultural Society of India.

At a Meeting, specially assembled, of the members of the Agricultural and Horticultural Society of India, (*forty Members were present.*)

The Hon'ble Sir Edward Ryan, President, in the Chair.

It was proposed by the President, seconded by James Pattle, Esq. and carried unanimously—

That this Meeting cordially approves of the union with the trustees of the Public Library, the Metcalfe Testimonial and the Metcalfe Library Fund, for the purpose of providing a suitable building for the Public Library and of this Institution, and is prepared to contribute towards the object, and that a Special Committee, composed of Colonel McLeod, Messrs. Pattle, Bagshaw, Corbyn, Robison, and William Grant, be appointed to inquire and communicate with the representatives (Messrs. Parker, Pattle, Grant, Bagshaw, and Carr) in order to prepare a plan and submit estimates for a building that shall be well adapted to the purposes of the Public Library, the Mechanic's Institute, and this Society, and that the same, when completed, be laid before the Society for its consideration and approval.

2. Moved by Sir John Peter Grant, seconded by H. M. Parker, Esq. and carried unanimously—

That an application be made to Government, by the aforesaid committee, for the grant of a piece of ground suitable for the erection of the building now contemplated.

3. Moved by C. K. Robison, Esq. seconded by R. J. Bagshaw, Esq. and carried unanimously, that insertion of the foregoing resolutions be given in the public prints of Calcutta.

HENRY H. SPRY, M. D. *Secretary.*

Town Hall, August 8, 1839.

AUGUST 14, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Rooms, Town Hall, on Wednesday, the 14th August, 1839.

(Ten Members and three Visitors Present.)

N. Wallich, Esq., M. D., F. R. S. Vice President, in the Chair.
The Proceedings of the last Meeting were read and confirmed.

MEMBERS ELECTED.

The following gentlemen proposed at the July Meeting were elected, viz.—Col. Fiddes—Lt. J. Eliot—Messrs. H. C. Halkett—F. Lowth—F. Courjon—W. P. Downing—A. S. Annand and F. A. Lushington.

FOR ELECTION.

The names of the following gentlemen were read as candidates for election at the next Meeting.

Geo. Sinclair, Esq., of Furreedpore,—proposed by Mr. William Bennett, seconded by Dr. Spry.

Geo. Scott, Esq., of Penang,—proposed by Dr. Wallich, seconded by Dr. Spry.

J. F. Harvey, Esq., C. S. and H. T. Raikes, Esq., C. S., of Chittagong,—proposed by Mr. Charles Bury, seconded by Dr. Spry.

Major Henderson, (Offg. Mil. Audr. Genl.) and the Venerable Archdeacon Dealtry,—proposed by Mr. C. K. Robison, seconded by Dr. Spry.

C. S. Stowell, Esq., of Agra,—proposed by Mr. Daniel McIver, seconded by Mr. W. F. Gibbon.

David J. Money, Esq., C. S.,—proposed by Mr. Cornelius Cardew, seconded by Dr. Spry.

Edward Riley, Esq., of Moulmein,—proposed by Sir Edward Ryan, seconded by Dr. Spry.

G. U. Yule, Esq., C. S., (Mymensing),—proposed by Mr. W. R. Logan, seconded by Mr. C. Cardew.

C. D. Russell, Esq., C. S., (Rungpore),—proposed by Dr. Wallich, seconded by Dr. Spry.

PRESENTATIONS TO THE SOCIETY.

LIBRARY.

Madras Journal of Literature and Science (No. 23). *Presented by the Madras Literary Society.*

MUSEUM.

1. A consignment of "Chulchulhera" or the Dyeing Lichen of the Himalayahs, in general use in the Upper Provinces as a dye. *Presented by Dr. Falconer.*

2. A bag of the "Chooneah Gond" or Gum of the Butea Frondosa (Kino) from Northern India. *Presented by Dr. Falconer.*

NOTE.—*The Secretary mentioned in connection with the above contributions that he had shipped to London a moiety of each sample for the report of the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland.*

3. Six samples (one Egyptian and five Upland Georgian) of Cotton the produce of the Saharunpore soil. *Presented by Dr. Falconer.*

4. Ten bags (each containing about 20lbs.) of acclimated Bourbon Cotton seed produced at Coimbatore (Southern India). *Presented by J. Jackson, Esq. on behalf of Archibald Arbuthnot, Esq. of Madras.*

In allusion to the Cotton produced from this seed Mr. Arbuthnot states, "that the Bourbon seed Cotton grown in the Madras Presidency (in Coimbatore and Salem districts) is decidedly the best ever produced in India."

5. A specimen of Kino Gum obtained from the Butea Frondosa in the Purulea District (Chota Nagpore). *Presented by Captain Hanynghton.*

6. Two boxes of Egyptian Cotton seed of best quality, &c.

7. One box of Egyptian Indigo seed; both presented by Thos. Waghorn, Esq.

NOTE.—*Mr. Waghorn desires expressly to state that he will accept no remuneration for this consignment, and begs to offer the seeds to the Society as a tribute of his regard for the Institution. A special vote of thanks was accorded to Mr. Waghorn.*

MOTION OF WHICH NOTICE WAS GIVEN AT THE LAST MEETING.

The motion proposed at the last Meeting by Major Carter, and seconded by Mr. Piddington "that the sum of five hundred rupees be assigned for obtaining from abroad a quantity of seed corn for distribution or sale, the amount of each description to be determined by the Committee or Society"—was agreed to, and ~~was~~ the recommendation of Mr. Robison, seconded by Mr. Dearie, a Committee composed of Major Carter, Mr. Piddington, and Mr. Speed was formed as a "Corn-Committee" for the economical expenditure of this grant.

NOTICE OF MOTION.

Proposed by Mr. Piddington and seconded by Mr. Hare, "that as a number of valuable agricultural papers are not strictly admissible in the Society's transactions, from having been printed in other books and pamphlets, it be referred to the Committee of papers, to ascertain whether the Society can without expense publish an appendix or volume of such useful papers."

THE NURSERY.

A report made by the Nursery Committee, was next read—the Committee state that since the last assembly of the Society the Members have twice met at the Garden, where the store plants from Saharunpore have been received but in a very ruinous condition, owing to the cases in which the young trees were packed, being stowed away in the bottom of the boat. A glazed case of dwarf fruit trees of various kinds has also been received from London, 48 of which are alive.

The Committee urge the contiguous Hill station of Darjeling as a locality the most desirable for acclimating these plants, and recommend that Dr. Campbell be addressed to aid the Society with means for transporting them to this Station, while the request of Messrs. Storm and Gibbon to be furnished with a portion for trial in their respective gardens near Calcutta, be complied with.

The suggestions of the Nursery Committee were approved of.
(See page 133.)



Paper by Mr. Bruce, Superintendent of the Government Tea Grounds in Assam.

The Secretary called the attention of the Meeting to a highly important and interesting communication which had been forwarded to him by Dr. Wallich, Secretary of the Tea Committee, for presentation to the Society. The Report was a most voluminous one, and was drawn up by Mr. Bruce. It comprised a statement of the earlier proceedings on the part of himself, connected with the establishment of the Tea Manufactory in Upper Assam, and the difficulties he has had to encounter in the conduct of the enterprise. Several interesting facts are recorded of his personal exertions to discover the new Tea Colonies which has been crowned with the most ample success. Indeed Upper Assam according to this valuable document may be considered an entire Tea garden. In many parts, one Tea tract runs into the other, and, in Mr. Bruce's opinion, the extension of the Cultivation is limited only by the means for working it. The Tea trees of Assam are much more luxuriant than those of China, the one being described as two or three feet high, while the other attains double that size. Indeed the Assam plants may be considered too luxuriant, and Mr. Bruce recommends, that the Tea jungle be burnt or cut down so as to furnish a supply of smaller leaves. Much stress is laid on the fact of the Tea of Assam not being so good as it might, owing to the want of hands to pick the leaves at the proper moment ; for the loss of 24 hours, when the leaf has attained its proper growth, is deemed of importance ; and again, the Tea procured from leaves, which have had the benefit of the sun's rays, is far superior to that procured from shady tracts. The account given by Mr. Bruce of the process of manufacturing the various sorts of the Tea both black and green, is novel and important. It appears, that the stage of growth of the plant regulates the production of one kind of Tea from the other. The leaves of the upper stem being roasted into one kind, and the leaves of the lower branches into another kind, and Mr. Bruce expressly states, that the trees of one plantation produce both the black and green Tea. The only difference consisting in the mode of preparing the leaves. The low and demoralised condition of the people are then alluded to, and the fact of the Assamese being great opium smokers is particularly dwelt on, as upon the suppression of this vice, Mr. Bruce considers much of the future well-being of the Society of Upper Assam will depend.

He feels assured, that unless the strong arm of the law be exerted to exterminate the drug, that the new comers attracted to the Province by the temptation of the Tea Culture, as well as those hired to proceed there, will inevitably become contaminated, however strong their prior resolution may have been, and, therefore, that one of the earliest acts of the Legislature should be the interdiction of poppy growing in the Province.

The Chinamen now employed at the Company's Plantations, Mr. Bruce describes as very irascible, but apt at acquiring the language of the country and fit to do without the aid of an interpreter after a residence of twelve months. One of the great *practical* difficulties which Mr. Bruce now labours under is the want of efficient labourers, much Tea being lost in consequence ; those he has at command playing all sorts of tricks to the great detriment of the economical management of the plantations. Thus Mr. Bruce states, that till the time for the sowing of their own rice grounds come round, he can obtain an abundance of labourers, but the moment the period arrives for their own particular husbandry they decamp ; and, again, that he can seldom get the same hands to pick the leaves (in which some particular art is required), two seasons following ; so that fresh hands have to be instructed every year.

Mr. Bruce urges the propriety of a further accession of Chinamen, and thinks that the time is near at hand when the Government of this country may fulfil the instructions of the Court of Directors by making over the enterprise to private speculation. Further, Mr. Bruce gives many interesting particulars of the art of preparing the lead canisters for packing the tea. The paper concludes by minute details of the cost, and manufacture of the plant, and shews an enormous profit to be derivable from the cultivation, calculating the wholesale selling price of the Tea at two shillings the pound. The report was deemed so valuable that the Meeting resolved that it should be printed forthwith in their proceedings, and circulated for the perusal of the Members at large. A valuable Map of the Tea localities, to the number of one hundred and twenty, is attached to the Report.

Establishment of a Public Garden at the Grounds of Secundra near Agra.

Mr. Kaine, Superintendent of the public garden at Secundra near Agra, communicates the progress made by him with the aid of 400

prisoners at improving the public grounds at that place ; previous to Mr. Kaine's receiving charge in October last year, there were two small patches of Nursery forest trees, containing Sissoo, Toon, Mhowa, Mulberry and ten or twelve other kinds for the purpose only of supplying the roads of Agra and any applicants. The garden itself was a perfect jungle which was speedily cleared away by the united labour of between 4 and 500 prisoners. In the course of two months the jungle was cut down, hay made of the grass, and one-fourth of the garden trenched. Eight beegahs (about three acres) of ground was planted with Otaheite Sugar-cane, and a large crop of vegetables raised, on which the labourers feasted abundantly. At Rambaugh a prison-house has been raised to hold 400 prisoners. The garden contains 200 beegahs (about 70 acres) of excellent garden ground and fourteen wells built of masonry. One quarter of the garden is designed as a vegetable and fruit garden, and the other three set apart for agricultural purposes.

The great consideration attended to in making this arrangement, Mr. Kaine states, to be the support of the prisoners by their own individual exertions, and as far as a few months' experience justifies the conclusion, the attempt has exceeded the superintendent's most sanguine expectations.

During the last season wheaten flour was of an indifferent quality in the Agra Province, and while the prisoners rested solely on it for support they were squalid in appearance. As soon as Mr. Kaine began supplying them with vegetables a change for the better took place, and in the space of 15 or 20 days the alteration was most perceptible. So happy have the men become under this treatment that Mr. Kaine states that they would not be known as prisoners, did the jingle of their irons not reveal the fact, and in conclusion Mr. Kaine adds that he anticipates, when the Secundra garden is properly established, to be able to send back the prisoners to their families better members of society, and promoters of what it is the object of the Agricultural and Horticultural Society of India to encourage.

The Capabilities and Natural Resources of the Line of Country southward of Midnapore, between that station and Sumbhulpore in the direction of the contemplated Calcutta and Bombay new post road.

The Secretary submitted a very interesting paper, drawn up by Lieutenant Kittoe, Superintendent of the new post road from Calcut-

ta towards Bombay, on the natural productions of the Orissa Province, through which the line passes. The whole of the hilly tracts of this Province, Lieutenant Kittoe states, to be capable of yielding various articles of commerce, according to the elevation and nature of the soil. The large vallies through which the principal rivers wend their course are most fertile—that of the Brahmeni, in particular where Lieutenant Kittoe has seen superb Sugar-cane, good Tobacco, an article which is extensively cultivated in some places, and yields a great profit to the growers, and different kinds of oil seeds, particularly the Castor oil plant.

Cotton is also cultivated. It does not thrive so well in the low tracts, as in the more elevated land. The finest kinds that Lieutenant Kittoe has met with have always been produced in the mountains, where the lands are well drained and the soil a stiff marl of a red colour, (from peroxyde of iron probably.) The people take great pains with their Cotton; the plants are set in rows at regular intervals, and the earth is well hoed and thrown up round them. Cotton and Turmeric are the chief articles of barter with the wild people of these parts, who are called *Kunds*; for there is no such thing as a standard currency throughout any part of the Hill tracts, salt, tobacco, brass cooking utensils and coarse muslins being the materials by which they measure their gains.

In the jungles of Dholbhoom and Mohurbhun much Silk (tussur) from the wild worm is produced. The worm thrives on the Assina tree. The lac insect has lately been introduced into Dholbhoom, and were the trade in both articles encouraged, Lieutenant Kittoe thinks, there is no doubt, but that it might be carried on to a successful extent. Very superior Tussur Silk pieces are manufactured at Sumbhulpore. The article is sought for throughout the Province, as all the better classes both male and female wear nothing else.

At Sumbhulpore Mr. Babington has for many years conducted a lac factory. Deer horns and hides are procurable in tolerable quantities.

Iron is common every where in the Orissa Province and superior qualities can be obtained in any quantity. That of Baumunghattie is famous in the estimation of the natives. Gold dust is to be had at Sumbhulpore, Dekkenal and elsewhere. It is washed for in the rivers and streams, and is melted into small lumps and bartered to the merchants.

The "~~Keth~~" (Catechu) and gum of the *Butea Frondosa* (Kino) is common.

The variety of timber and other trees is very great. The better kinds, however, are not common. The Kend or "Tendoo" (bastard ebony) is very common and very fine logs are procurable. Lieutenant Kittoe has frequently met bullock loads of this timber, rough ~~rough~~ ^{rough}, on the way to Midnapore for the Calcutta market.

The ebony is turned into 'rulers' and 'clubs,' &c. for the use of the natives.

The *Nux Vomica* tree (Kucheela) grows to an immense size, and the wood would, Lieutenant Kittoe thinks, be useful for furniture as well as for the bottoms of boxes, or for any purpose wherein the white ants are to be guarded against, for no insect will touch this poisonous material. The Sissoo tree (*Dalbergia Sissoo*) is common and of a very beautiful kind, particularly in the Cuttack Forests. As for the roads at present the best are found in the vicinity of the rivers. The Subunreeka river is navigable for rafts for six months of the year. So is the Burd Balung, the Brahminie, Salindee, Kurooa, Byeturnea, and these five rivers empty themselves into the sea, near False Point. There are very good quarries of superior sandstone on the Brahminie, *which might be worked and the stone brought up to the Calcutta market at a far lower rate of expense than the Chunar stone now is.*

Lieutenant Kittoe also mentions, that he is of opinion, that Flax could be grown in any quantity in the richer soils of the valleys. Wheat, barley ~~and~~ gram (*Cicer arietinum*) thrive well. Of the latter Lieutenant Kittoe observed superb crops in Dholbhoom. Maize would also thrive, but the people, from the state of degradation in which they are kept by their Native Chiefs, cultivate only sufficient to suffice for their limited wants. From what Lieutenant Kittoe has heard of the Tea localities of Assam, and from the specimens of Tea soil which he has inspected, it occurs to him that the Kunjur Mountains would be well calculated for the cultivation of this valuable shrub.

Lieutenant Kittoe hopes to be able, in the approaching cold season, to open a line of road from the Berar Province to Midnapore, and thus the traffic of these parts, instead of going by the tedious and circuitous route of Cuttack, be brought into a more direct and favourable one, to the banks of the Subunreeka, where the half wild races who frequent this part of the Province might

have a mart established for them. Three such places already exist, but not in such favourable localities as Lieutenant Kittoe would recommend. That considerable traffic at some former period existed, the remains of a fine road and the ruins of tanks and mango groves fully testify, but the system now pursued by the petty Chiefs, who exercise their power under the British Government, effectually checks all inclination on the part of the people to return to the former state of things, by severely punishing all who in the least degree offer to assist with supplies strangers who come among them. Lieutenant Kittoe, in conclusion of this most valuable practical paper, adds, that if he can be of any assistance to the Agricultural and Horticultural Society of India, during his approaching tour, he shall be most happy in doing all in his power.

Progress of the Society's Experimental Garden at Katmandoo, in Nepal.

The Secretary next brought forward a letter from Captain Gordon at Katmandoo, intimating that he had dispatched on the 29th June last, two tin boxes (*which have not yet come to hand*) containing one maund and twenty-six seers of garden seeds, partly Cape, American and Nepaulese, the produce of the Society's Horticultural Garden in that country, and asking whether the Society desire to continue its experiments in receiving plants for seed at Katmandoo. Captain Gordon in the absence of Dr. Campbell, offers his services should the Society determine on keeping up the establishment and furnishes a statement of expenses incurred, in which the Society possess a balance due to it of 56-8-5.

In connexion with this subject, and adverting to the recommendation of the Nursery Committee given in the former part of this Report, the Secretary read a letter from Dr. Campbell now in charge of the Hill Station of Darjeling. Dr. C. mentions that if the Society will point out to him how he can in any way forward its objects at or near Darjeling it will afford him pleasure to make an effort. The Members therefore determined that Captain Gordon should be thanked for his polite offer, and be informed that the proximity of Darjeling to Calcutta being so much greater than Katmandoo, that the continuance of the experimental garden for another year at Katmandoo be relinquished and Darjeling be selected instead.

Report furnished by the Home Committee on Samples of Cotton grown near Calcutta, by Charles Huffnagle, Esq.

Dr. Royle, Secretary to the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland furnishes a copy of the Broker's report on the sample of Cotton for—
U. G.

~~Shaded~~ last year to England marked H. in diamond and grown by Dr. Huffnagle at his garden near Calcutta. This Cotton (vide the Secretary's "Summary," p. 51, June proceedings) was a *second* year's crop from seed imported by the Society in 1836. By the Cotton judges of Calcutta this bale was pronounced to be the finest specimen that has been submitted to the Society, and the following is the report of Mr. Jas. R. Tetley, Cotton Broker of Mincing Lane, London, April 17, 1839.

"The Fibre (usually called the staple) is fine and pretty strong, but very uneven in length—a great part being very short. There is some longer and a little very long, which renders it difficult to manage on the manufacturing machine. The Cotton is clean and probably injured in the process of cleaning. The color is good, yet there are some stains which of course are objectionable. The value is about 7½d. per lb. rather more than the best Surat. If the staple were more even, at about the medium length, it would be worth 8½d. the present value of middling America Upland Cotton.

"There is sufficient in the above to shew, that with a regular supply of fresh seed from America, and the superintendence of people who understand the plant and its management, that Cotton of equal quality to that of America may be grown in the East Indies; an object of the first national importance seeing how dependent this country is on America for the great bulk of the raw material."

For all the above presents and communications the thanks of the Society was accorded.

Claims for exemption of payment for Sugar Canes supplied from the Society's Nursery.

A letter from Joykissen Manojee, Esq. was read, claiming exemption of payment for sugar-canes supplied to him on the plea that when he applied for the canes he understood they were to be furnished to him gratis, and that he was unconscious of the subse-

quent resolution of the Society passed at the general monthly meeting of October last, wherein a rule was made that every cane should be charged at one anna. Moreover, claiming exemption on the further ground of public advantage to the District of Hooghly, where the canes were distributed, as they were not appropriated to his own private purposes.

The subject underwent full discussion, and the meeting ~~decided~~ that the Society could not after the ample publicity given to the resolution of October, excuse the payment of the bill.

A further claim to exemption from payment for sugar-canes was made by Dwarkanauth Tagore, Esq. in consequence of a misapprehension on his part, at the time the canes were offered to him by the Secretary, that they were so offered for the sake of getting rid of them, as the month of April had arrived and the canes were dying. In this case also a long discussion ensued. Dwarkanauth Tagore, Esq. stated he never contemplated having to pay for the canes, and that he should be happy to return a similar number to what he had received to the nursery during the next season; whereupon it was proposed by Mr. Robison, and seconded by Dr. Spry,

“That as it appears these canes were received by Dwarkanauth Tagore, Esq. under the belief that he was not to pay for them, his offer to return them to the Society be accepted, and the bill cancelled.”

Major Carter remarked that to Dwarkanauth Tagore, Esq. Bengal was indebted for the early spread of the Otaheite sugar-cane and that his extensive factories had done much to test the power of this variety of cane for sugar making, he therefore moved as an amendment to this proposition,

“That the bill be cancelled, in consequence of Dwarkanauth Tagore, Esq. having been an original and large contributor of Otaheite cane to the Society.” Mr. Hare seconded it, and on a show of hands the amendment was carried.

HENRY H. SPRY, M. D.

Secretary.

PROCEEDINGS OF THE GARDEN COMMITTEE.

FRIDAY, JULY 25, 1839.

A meeting of the Garden Committee was held on the above date, at the Botanical Garden.

W. Wallich.

Present.

Dr. Wallich, William Storm, Esq. and Dr. Spry.

Agreeably to the Resolution come to at the Meeting of the Committee on the 18th May last, the members have again met. The store boat with fruit trees and other productions from the Saharunpore Botanic Garden have reached the Society's Nursery.

In all there are nineteen boxes, which when taken from the bottom of the country boat (patella) where they had been confined through the inattention of those in charge, instead of being exposed in an open part of the vessel, appeared in a very sickly and dead state,—but the Committee are happy to have it in their power to record, that although a few days only have elapsed since their being landed, vigour in many that seemed past recovery has shown itself, and under these circumstances, the members do not deem it fair to draw any final opinion as to the eventual out-turn of the consignment, and therefore resolve, that on this day fortnight, 9th proximo, the Committee should re-assemble at five o'clock precisely.

FRIDAY, AUGUST 9, 1839.

In conformity to the arrangement passed on the 25th ultimo, a Meeting of the Committee was called for this day, but, owing to the unsettled state of the weather and the indisposition of one or two of the members, but Dr. Wallich and the Secretary were at the Nursery.

Since the assembly of the Committee, a box containing an assortment of various fruit trees of Europe, has been received from Messrs. Noble and Sons of London, in a closed glazed box which was landed from the "*Malcolm*" on the 3rd instant, and without loss of time forwarded to the Society's Nursery. The plants are found to be generally in very good condition. Some casualties have

occurred, but that was a matter of course. The plants are already beginning to benefit from exposure to the air. This and next month are unfortunately the most hazardous for the preservation of extra-tropical plants introduced to the climate of Lower India and Bengal particularly. It has occurred to us that the sooner these are potted, the better, and as the number, at present in the Society's possession will only admit of a very partial distribution, it really is a matter of great difficulty to determine on what principle to proceed in the mode of allotment.

The contiguous hill station of Darjeeling is perhaps, for safety in acclimating, one of the most desirable localities that can be fixed on,—and should it be determined to select this spot, Dr. Campbell might be written to, to have people in readiness to receive the supply on its being landed from the steamer. Messrs. Storm and Gibbon, both having good and desirable gardens for the introduction of fruit trees, are anxious to give a portion of the present supply a trial ;—we would recommend that their applications be complied with, especially as the former gentleman states that “ it will be a pleasure to distribute hereafter grafts from such as he may succeed in rearing ;—and the residue to be sent to Darjeeling.

We likewise inspected the plants received from Dr. Falconer ;—we are happy to have it in our power to mention that they are improving,—and may now safely be potted.

(Signed)

N. WALLICH, M. D.
HENRY H. SPRY, M. D.
W. STORM,
THOS. LEACH,
CHAS. HUFFNAGLE.

SEPTEMBER 11, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Rooms, Town Hall.
to wit

C. K. Robison, Esq., Vice President, in the Chair.

Thirty Members and one visitor present.

The proceedings of the last Meeting were read and confirmed.

MEMBERS ELECTED.

The following gentlemen proposed at the August Meeting were elected Members, viz. :—The Venerable Archdeacon Dealtry and Major Henderson,—Messrs. Geo. Sinclair,—Geo. Scott,—J. F. Harvey,—H. T. Raikes,—C. S. Stowell,—David J. Money,—Edward Riley,—G. U. Yule, and C. D. Russell.

FOR ELECTION.

The names of the following gentlemen were read as Candidates for election at the next Meeting.

Captain Mylius, (Cameronians)—proposed by Dr. Corbyn, seconded by Dr. Spry.

Welby Brown Jackson, Esq. (Commr. of Moorshedabad)—proposed by Mr. F. W. Russell, seconded by Dr. Spry.

Major Colnett, (Barrack Master at Fort William)—proposed by Dr. Spry, seconded by Dr. Corbyn.

William Prinsep, Esq.—proposed by Dr. Spry, seconded by Mr. C. K. Robison.

Lieutenant Eld, (Munnipore Levy)—proposed by Major R. Becher, seconded by Dr. Spry.

B. H. Hodgson, Esq. (Resident at the Court of Nepaul)—proposed by Dr. Wallich, seconded by Dr. Spry.

Lieutenant Rowley Hill, (Oude Cavalry)—proposed by Dr. Spry, seconded by Dr. Wallich.

P. Macdonald, Esq. (of Midnapore)—proposed by Mr. H. Piddington, seconded by Mr. D. Hare.

PRESENTATIONS TO THE SOCIETY.

LIBRARY.

1. No. 10 of the Transactions of the Society of Arts, London.—*Presented by the Society of Arts.*

2. Six Copies of the Proceedings of the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland for the year 1838.—*Presented by the Royal Asiatic Society.*

3. Proceedings of the Quarterly Meeting of the Agricultural and Horticultural Society of Madras.

In allusion to a former notice of this Society on the subject of pecuniary receipts, the Secretary brought to the notice of the Meeting the circumstance that the expression of the Madras Committee's report had reference to the Bombay Agricultural Society as well as to the Agricultural and Horticultural Society of India.

4. A Pamphlet on the objects and history of the Thames Improvement Company.—*Presented by Mr. Johnson on the part of his brother, the author.*

5. Abercombie's Practical Gardener and improved System of Modern Horticulture, adapted to small or large gardens and designed for Gentlemen who manage their own gardens.—*Purchased by the Society.*

6. A translated account of the prosperous condition of the Tea Plant on the Neilgherries, and of the advantages to be derived from cultivating it on a grand scale in the elevated parts of India. By M. Perrottet, Botanist to the French Government.—*Presented by the Bengal Tea Committee.*

MUSEUM.

1. A Machine for cleaning Cotton which has been made at Glasgow, under the auspices of the Glasgow East India Association.—*Presented by the Bengal Chamber of Commerce.*

This Machine has been sent to India, experimentally, for the purpose of being tried as an efficacious invention for cleaning Cotton. It is on the principle of the Churka which was sent to the East India Association of Glasgow by the Chamber of Commerce at Bombay. It is about the same size, weighs about sixty pounds, and may be easily moved from place to place as the common churka. By it the Seeds which accompanied the native Machine from Bombay were effectually separated from the Kupas or Cotton, and without injury to the staple, but no impression is made on the broken leaf and other impurity, for which there would seem to be no remedy but an improved system of picking.

Soft Seeds are liable to the same contingency, and in order to prevent them from passing between the rollers, it was found necessary at Glasgow, to first dry the Kupas on a kiln, which procedure will be obviated in the climate of India by exposure to the sun.

In presenting the foregoing simple and apparently very efficient apparatus, the Glasgow Chamber only ask in return to be furnished with a report of the result, which has attended its use. And further entreat, that so far as lies in the power of the Chamber of Commerce of Bengal, that that body will do its best to reserve the orders for making a number of them for Mr. Houldsworth, to whose skill and attention, the Association at Glasgow is indebted for the improvement. If many are required, they would not cost above £4 sterling each. The two now exhibited may be worked separately or together, and any number which there is power to work may be united by simply lengthening the shaft. Each will only require one person to feed it.

The Directors of the East India Association of Glasgow have sent two each to Bombay and Madras, and the Court of Directors of the East India Company have ordered four for their Bombay Presidency.

The Members present took a great interest in the exhibition of this Machine, and the Cotton Committee were desired to test it more fully, and to favor the Society with a report on the result of the trials.

2. A sample of Cashmere Angora-goat wool obtained at the Cape of Good Hope from an animal imported into the Colony from New South Wales.—*Presented by Captain Charlton.*

3. Specimen of Caoutchouc from Sylhet.—*Presented by Dr. Spry.*

4. Sample of Cotton, grown at Rajmahal.—*Presented by Mr. Richards.*

5. A small basket of Potatoes, the produce of Darjeling.—*Presented by Dr. Wallich on behalf of Dr. Campbell.*

They are of this season's produce and although considered by Dr. Campbell of an inferior kind, they appear to Dr. Wallich greatly preferable to any which can be procured in the Calcutta Market at this time of the year.

6. Three specimens of indigenous Bengal Cotton. No. 1, the same kind as that lately furnished by the Society for trial in Assam. No. 2 is of a coarser but longer fibre, and No. 3 is a black-seeded Cotton.—*Presented by Mr. Dearman, Secretary to the Dacca Branch Agricultural Society.*

Mr. Dearman thinks, that No. 3 is fully equal to Egyptian, or Sea Island in silkiness. He states, that he obtained a clue to the discovery of this as well as to No. 2 specimen, by examining some old records ; but he only became aware of their being still to be found in cultivation within the last few weeks. The specimen No. 3, was considered by the Meeting as a very superior indigenous Cotton, and Mr. Dearman was requested to supply the Society with further particulars. What is remarkable with regard to the specimen marked No. 3, is that Mr. Dearman states, that it is obtained from a tree which is PERENNIAL of four or five years growth.

7. Eight cobs of Maize, from acclimated American Seed, grown at Palmadeeah, near Sook Saugor.—*Presented by Mr. Quantin.*

8. Four samples of Sugar, manufactured at Amherst.—*Presented by Mr. Riley. The whole of the samples have been pronounced of a superior quality. No. 1 is of good colour and fine strong grain. No. 2, middling quality. No. 3, a shade better, and No. 4, very coarse brown Sugar, which would meet with a ready sale in the Calcutta Market in any quantity.*

9. Six samples of Grains, from the Nerbudda Territory. No. 1 is best wheat called "Julalya," grown only in the Southern banks of the Nerbudda, in the Hoshingabad District. No. 2 is a second best wheat called "Kulya;" it also grows in Hoshingabad. No. 3, "Parbutteea" or white Cheenna, a very fine grain, found only where the Julalya wheat grows. No. 4, is common Cheenna*. No. 5, white Til†, flower white and blue. No. 6, black Til‡. *Major Ouseley, who presents these grains to the Society through Dr. Wallich, not having observed them noticed any where, he wishes to have information regarding them. They were referred to the Agricultural Committee.*

* Cicer Arietinum.—H. H. S.

† Verbesina ———.—H. H. S.

‡ Verbesina Sativa.—H. H. S.

MOTION OF WHICH NOTICE WAS GIVEN AT THE LAST MEETING.

The motion proposed at the last Meeting by Mr. Piddington, and seconded by Mr. Hare—"That as a number of valuable Agricultural papers are not strictly admissible in the Society's Transactions, from having been printed in other books and pamphlets, it be referred to the Committee of Papers to ascertain whether the Society can without expense publish an Appendix or volume of such useful papers"—was carried.

Introduction of Foreign Seed Corn into India.

The Report of the Corn-Committee was brought up and read. The propriety of affording the Landholders of India an opportunity of trying different varieties of the European, African, and American cercal grains on their Estates, was first adverted to and highly approved of, as being likely to be attended with benefit to the interests of the country at large; and the Committee in consequence, in order to give as extended a range as practicable to this recommendation, begs to offer for the approval of the Society, a public notification to the effect that the Agricultural and Horticultural Society of India, being desirous of effecting the introduction of foreign seed corn into India, is desirous to receive and register applications from all persons who are desirous of procuring seed for trial on their lands; and will use their best endeavours to obtain the same from Europe, Africa and America. A reference for payment to be furnished at the same time. In addition to this the Committee desire to recommend, and the same was adopted, that a quantity not exceeding a ton of each kind, be obtained for the use of the Members of the Society.

Plans adopted to secure such Plants and Trees as may be thought desirable for introduction into India, as well as those that can be furnished in return.

The Committee appointed to assist in carrying out the views of the Honorable the Court of Directors, contained in their despatch of the 30th February last, have twice assembled.

The Committee report as a part of the business of their Meetings having read correspondence and Minutes of Council by the Most

Noble the Marquis of Hastings, contained in their journals, regarding the establishment in the year 1823 of a garden at Titaghur near Calcutta, as a branch of the Honorable Company's Botanic Garden, where among other things it is stated that "a great number of curious plants, have been introduced for the trial of naturalizing them to the climate of Bengal. Food, Manufactures, and Medicines being the objects which decided the choice." Also parts of a paper conjointly addressed by the Honorable Holt Mackenzie and Dr. Royle, to the Members of the Royal Asiatic Society of Great Britain :

A list of Trees and Shrubs of Asia suitable for introduction into temperate latitudes furnished by Loudon in his *Arboretum et Fruticetum Britannicum*.

A list of Medicinal plants and gum-yielding trees amounting to 86 in number, collected by Dr. Spry in 1831, while residing in Southern Bundelkand.

A list of useful grasses and other articles by Mr. Johnson, and lastly, a list of plants calculated for introduction and propagation throughout Lower and Upper Hindoostan by Dr. Spry.

The Committee recommend that a circular letter be addressed to all persons who may be likely to assist in forwarding the views of the Society, and desire that the information sought may be classed under three heads.

1st. Food comprising esculent grains of all kinds, Medicinal plants, fruits and roots.

2nd. Fodder and food for cattle and domestic animals ; comprising grasses, seeds, fruits, roots and leaves : also any ornamental shrubs and flowers.

3rd. Manufacturing and commercial articles such as oils, gums, dyes and barks, or any other known or unknown staples of commerce : also oaks, firs, teak-trees, &c.

The Committee desire to state that any suggestion, even of a single article only, will be deemed valuable ; as it is solely by the union of the scattered *practical* knowledge of individuals, that the surest information can be obtained, and the development and consequent improvement of the resources and wealth of India and England be mutually promoted.

The value of Guzerat as a Cotton Province.

A communication was read by the Secretary which had been forwarded to him by Mr. Owen Potter, of the firm of T. and S. Kelsall

of Calcutta, on the subject of the cotton trade in Guzerat. Mr. Potter when at Manchester, lately addressed this communication to the Chamber of Commerce in that city, and the substance of it formed a portion of the business which was submitted to the Honorable the Court of Directors on the occasion of the Manchester Deputation waiting on the Court at the India House. Mr. Potter states that in the spring of 1837 he was occupied in Guzerat in purchasing, cleaning, packing, and shipping cotton. The chief cotton ports are Surat, Baroche, Tankaria Bunder, Gogo, and Bownugger. All these ports are within a short distance of each other. The extent of cotton cultivation in their vicinity is very great, as will be seen by the following statement of exports :

	1836.	1837.
From Baroche,	42,000 bales,	20,000 bales.
— Tankaria Bunder, ..	20,000 bales,	12,000 bales.
— Surat,	25,000 bales,	15,000 bales.
— Gogo and Bownugger including the Dholera Cotton, ..	60,000 bales,	45,000 bales.

Total, . . 147,000 bales.

Each bale weighing about 400 lbs.

Nearly the whole of the Cotton here mentioned grows within 40 miles of the port at which it is shipped. The country is flat and the freight to Bombay amounts to no more than two per cent. on the value of the Cotton. These localities on the coast are more frequently inundated than any others, and great portions of the seed when sown are frequently entirely washed away. At Omrawutte Cotton is grown at the rate of two pounds for twopence in moderately favorable seasons ; and did good roads but only exist, this article could be delivered at Bombay at a handsome remunerating price. It is now carried on the backs of bullocks, and, as it now is, the extra cost amounts to a penny a lb. more. The Government levy their tax in this part of the country on kind, taking one half of the produce for the payment of their land tax : each pound of Cotton therefore stands the grower in twopence, with the additional penny to Bombay.

The Cotton of Omrawutte which is situated nearly 500 miles from any port, Mr. Potter describes as little inferior to that grown in Guzerat, which is looked upon as the garden of the western side of

India. But from the circumstance of the land tax being levied at a much higher ratio than in the Berar Province, much valuable Cotton land still remains uncultivated. In Guzerat the rate of taxation often proves 50 per cent. on the market value of the Cotton.

Mr. Potter alludes to the total absence of all port conveniences for shipping the Cotton at any of the places before mentioned, and states that for the want of sufficient accommodation the porters are obliged to sling the cotton bales on bamboos, and each bearing an end on their shoulders wade up to their waist in mud and water before they can approach even a boat large enough to convey ten or twenty bales to the vessels. There is some little accommodation at Surat. At Baroche there was formerly a commodious pier, but of late years, though the trade of the place has rapidly increased, the pier has been allowed to fall into ruins, and in 1837 was utterly useless.

The Cotton pod in Guzerat is overhung by a tender brown leaf, which, when the dew is on the plant early in the morning, is soft, yields to the hand, and will not break; consequently all the early * pickings are free from leaf. Mr. Potter thinks that a system of rewards and fines might be introduced among the Patells of the Cotton Villages with advantage; and he adds that little improvement in the preparation of the Cotton for the English market can be expected, till British capital and industry are employed in the undertaking immediately, on the spot where the Cotton is grown. Under judicious management, Mr. Potter is convinced that Europeans may find ample remuneration by turning their attention to the culture of Cotton. No attempt has yet been made to any extent, and generally Mr. Potter does not doubt, that Agriculture under the immediate management of Europeans would become common.

Mr. Potter concludes by a reference to the benefits to be expected to Cotton Culture from *judicious* irrigation. And he alludes to the advantages obtained in Egypt and Peru to the Cotton-grower by this mode of procedure.

Facility of the Province of Amherst for the Cultivation of Sugar.

The Secretary next submitted a paper by Mr. Edward Riley, on the nature of the Sugar-cane grown in Amherst, and the mode of cultivation adopted by the natives, with the qualities of the indigenous Cane as compared to the Otaheite kind, in order to arrive at correct data for extending this useful cultivation. The indigenous

Canes grown in the Amherst Province consist of the Ratan and Red Cane varieties, the former being in more general use, on account of its extreme hardness. The latter, however, is superior in quality, and generally attains a height of five feet.

Mr. Riley then enters into details regarding the mode of procedure to be adopted in clearing the lands, and the cost of preparing a Sugar estate. He remarks that very few Burmese will work even six months consecutively. With apathy peculiar to their character, the Burmese look no further than present gains,—the only labour required to produce a fair crop of rattoons would be merely banking the plants during the rains and trashing them properly, neither of which duties however are done. The paper concludes by reports on the four samples of Sugar which are recorded as having been presented to the Society among the presentations to the Museum.

Progress of the Foreign Cotton Cultivation in Central India.

The Secretary next read a portion of a letter from Mr. McLeod in charge of the Saugor District, acknowledging the receipt of the late consignment of foreign Cotton Seeds, and communicating some interesting details connected with the progress of the cultivation of a very encouraging character. Mr. McLeod considers that it is the prevalence of black basalt where this is of a sufficiently friable character (*mund* in fact) that renders the Saugor country, Nursingpore and especially Berar so pre-eminently a Cotton country. The vigor with which Cotton thrives in it is astonishing. In Berar (the Nagpore country) the black basalt soil yields two crops of Cotton a year; the rabbee or spring harvest crop being the most esteemed. All the Cotton that Mr. McLeod sowed last year is left standing, and besides this there are the Pernambuco and Egyptian varieties in their third year. Sufficient Cotton has been procured to make one or two bales, and next year, as there are upwards of ten beegahs ($3\frac{1}{2}$ acres) in Cotton cultivation, Mr. McLeod hopes to be able to send to the Society a respectable supply. Mr. McLeod has sown with both the common country and Deccanee plough, but the success of the latter method is doubtful, as all the country people state that unless the Cotton seed be sown on the surface, and in land not worked deep, it all runs to leaf and stalk, yielding little flower. Some of the Cotton planted in the garden close to the water courses have yielded a crop and flourished with a vigour far exceeding all

the rest. Mr. McLeod feels confident that the *Mannua* or *Déo Ku-pass* of the natives is identical with the Pernambuco—an inquiry which he considers deserving of the consideration of the Society. The staple of this kind of Cotton is extremely long, far exceeding all other kinds, but it is weak. Another indigenous perennial, known as the *Nadan Ban*, and of which the Brahmins make their threads, Mr. McLeod finds to be stronger and finer than any of the *imported* kinds, but from the length and slenderness of the stalks, and abundance and fruitiness of the leaves, it is extremely difficult to pick clean.

A New Horticultural Garden at Darjeling.

A letter from Dr. Campbell, the officer administering the Civil and Political duties at Darjeling, was read by the Secretary. Dr. Campbell offers to get the English gooseberry, currant, and raspberry trees, lately landed from the *Malcolm*, which the Society determined at their last Meeting should be despatched to Darjeling for acclimation, with as little delay as possible, after their arrival at Titalya. No enclosed ground for them is yet ready, but Dr. Pearson has offered to give them a place in his garden, until a suitable place can be got ready. Dr. Campbell states, that it has been suggested to him by Mr. Low, who is at Darjeling, and has shewn the greatest anxiety to forward the views of European settlers, to make this consignment the nucleus of an experimental garden for the Society, and to this end, Dr. Campbell, Mr. Low and Dr. Pearson offer a donation of 50 Rupees each for the promotion of this interesting object. Dr. Campbell supposes, that many in Calcutta, who are interested in the welfare of the new Hill Colony, will be desirous of aiding the project.

The subject underwent a long discussion at the Meeting, and it was determined to give the new Horticultural garden support by supplying from time to time, such plants and seeds as were likely to be suited for the Darjeling climate, while an extract of Dr. Campbell's note, having reference to the raising of subscription to the promotion of the Fruit Tree Cultivation, was ordered to be furnished to the Darjeling Committee.

Arrival of American Garden Seeds.

The Secretary informed the Meeting, that the arrival of the *Active*, from Boston, enabled him to have the pleasure of announc-

ing the receipt of five cases of American Garden Seeds, of different sorts, which had been procured through the kind assistance of Mr. Huffnagle, of this city.

For all the foregoing communications the thanks of the Society was accorded.

The following proposition was moved by Mr. Charles Dearie, seconded by Mr. W. F. Gibbon, and carried by the Meeting :—

“ That in future, so long as our monthly proceedings are printed and circulated, to save time at the monthly Meetings of the Society, the Secretary instead of reading the whole of the proceedings of the previous meeting, shall merely read the heads of such subjects, as may have come before it, which it is presumed will afford (in connection with the printed Reports) sufficient information to Members.”

HENRY H. SPRY, M. D., *Secy.*

ADVERTISEMENT.

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA.

The Agricultural and Horticultural Society of India, being desirous of effecting the introduction of *Foreign Seed Corn* into India, are prepared to receive and register applications from any persons who may be desirous of procuring Seed for trial in their lands, and will use their best endeavours to obtain the same from Europe, Africa, and America. It is requested that Individuals will furnish a reference in Calcutta for the amount of their orders, which will be supplied at invoice cost price.

EXHIBITION OF PRIZES.

ERI-SILK.

The Agricultural and Horticultural Society, in conjunction with Captain Jenkins, the Governor General's Agent in Assam, beg to call the attention of the public to the following notification :

1st.—To any person who may succeed in discovering an effectual and cheap solvent for the adhesive material which attaches to the Cocoons of the Eri-Silk-Worm,—so that the Silk can be made useful to commercial purposes ;—

THE SOCIETY'S GOLD MEDAL AND 200 RUPEES.

2nd.—For the best and most economical mode of preparing Floss, and also the manufacturing of a fine thread from the floss of the Eri-Cocoons ;—

THE SOCIETY'S GOLD MEDAL AND 200 RUPEES.

3rd.—For the best and most economical method of bleaching Cloth manufactured from the Eri-Cocoon, so as to take permanent and fugitive dyes well ;—

THE SOCIETY'S GOLD MEDAL AND 200 RUPEES.

CONDITIONS.

No Claimant to any of the above rewards shall be entitled to the prizes, till they have furnished the Silk Committee with the fullest particulars of their discovery ; and the Society further reserves to itself, the right of withholding the award of prizes till the experiments of the Claimants have been tested on an efficient scale.

FOR STAPLE PRODUCTIONS.

The following Prizes are offered to the producers of the best Samples of the undermentioned Staples of the Bengal Presidency, agreeable to the resolution of the Society passed at a Meeting held on the 14th November, 1838.

SUGAR.

1st.—For the best Sample of *unrefined* Sugar, not less than 2 maunds, *The Gold Medal.*

For the second best Sample of *unrefined* Sugar, as above, *The Silver Medal.*

SILK.

2nd.—For the best Sample of Silk, not less than 2 seers, *The Gold Medal.*

For the second best Sample of Silk, as above, *The Silver Medal.*

COTTON.

3rd.—For the best Sample of Cotton, raised from Foreign Seed, not less than 2 maunds, *The Gold Medal.*

For the second best Sample of Cotton, raised from Foreign Seed, as above, *The Silver Medal.*

TOBACCO.

4th.—For the best Sample of Tobacco, reared from Foreign Seed, not less than one maund, . . . *The Gold Medal.*

For the second best Sample of Tobacco, reared from Foreign Seed, as above, *The Silver Medal.*

CONDITIONS.

1st.—The articles exhibited by Candidates for Medals, must be the produce of Bengal and the North Western Provinces.

2nd.—The competition will be open to all persons whatever, without distinction.

3rd.—The articles must not be garbled, but *bonâ fide* the average produce of the land on which they are grown, or of the manufacture.

4th.—All Candidates for Medals must deliver with their specimens, statements of the places at which the articles were produced, the quality or nature of the soil, and of the mode of cultivation and manufacture, and the cost of production.

5th.—A moiety of the specimens which shall be declared entitled to the *Gold Medals*, shall be the property of the Society, the remainder will be returned to the Candidates.

6th.—Candidates are requested to affix to their specimens, a number or mark, and to accompany them with a sealed letter and to mark the letter addressed to the Secretary with the words 'Competition Letter,' which letter will remain unopened till after adjudication.

7th.—When two or more Samples shall be considered to be of equal quality, the Medal will be awarded to the sample which may appear to have been raised at the least cost, and with reference also to the greatest quantity produced upon a given area.

8th.—All Candidates are expected to have their specimens in the possession of the Secretary of the Society, on or before the 1st May, 1840.

FOR CATTLE.

In accordance with the vote of the Society, at a Meeting held on the 10th April, 1839, the following schedule of Rewards for Cattle of various kinds to be exhibited at the Annual Show on the 1st of February next, was passed.

IMPORTED NEAT CATTLE.

1st.—For the best imported Bull of the year 1839, not less than two years old,—a Premium of 500 Rs. and the Gold Medal.

2nd.—For the second best imported Bull of the year 1839, not less than two years old,—a Premium of 400 Rs. and the Silver Medal.

The same for the year 1841.

NOTE.—(A Preference will be shown to the Devonshire or Middle-horned Bull.)

PRODUCE.

3rd.—For the best produce of Imported Cattle,—a Premium of 250 Rs. and the Gold Medal.

4th.—For the second best produce of Imported Cattle,—a Premium of 200 Rs. and the Silver Medal.

5th.—For the best *Bull* Calf of any denomination calved in 1839,—the Gold Medal.

6th.—For the best *Cow* Calf of any denomination calved in 1839,—the Silver Medal.

SHEEP.

1st.—For the best imported Woolled Merino Ram of the year 1839, not less than two years old,—a Premium of 200 Rs. and the Gold Medal.

2nd.—For the second best imported Woolled Merino Ram of the year 1839, not less than two years old,—a Premium of 150 Rs. and the Silver Medal.

The same for the year 1841.

3rd.—For the best pen of Merino Ewes to the number of six,—a Premium of 100 Rs. and the Silver Medal.

4th.—For the best thorough bred Merino *Ram* Lamb, lambled in 1839,—the Gold Medal.

5th.—For the best thorough bred Merino *Ewe* Lamb, lambled in 1839,—the Silver Medal.

6th.—For the best Lamb, either Ram or Ewe, cross of a Merino Ram and an indigenous Ewe, lambled in 1839,—the small Silver Medal.

CONDITIONS.

1st.—The competition is open to Stock from any part of the world.

2nd.—The Pedigree and Age of the Stock, so far as known, must be given.

3rd.—The Committee of the Society appointed to conduct the arrangements for the Show, will appoint skilful persons to act as Judges.

4th.—The Committee reserve to themselves the right of withholding any of the above rewards, should the numbers of either class brought forward be insufficient, in their opinion, to establish a legitimate competition, or in the opinion of the Judges from inferiority, not to be deserving of a prize.

HENRY H. SPRY, M. D., *Secy.*

A. and H. Society's Room, Town Hall,

Calcutta, Sept. 12, 1839.

OCTOBER 9, 1839.

Agricultural and Horticultural Society of India.

A General Meeting was held at the Society's Room, Town Hall.

C. K. Robison, Esq., Vice President, in the Chair.

(Twenty Members present.)

The Proceedings of the last Meeting were confirmed.

MEMBERS ELECTED.

The Gentlemen proposed at the September Meeting were elected Members, viz. :

Captain Mylius, Major Colnett, Lieutenant Eld, Lieutenant Rowley Hill, Messrs. W. B. Jackson, B. H. Hodgson, William Prinsep and P. Macdonald.

FOR ELECTION.

The names of the following Gentlemen were read as candidates for election at the next Meeting :

John Storm, Esq.—proposed by Mr. William Storm, seconded by the Secretary.

M. D. Cohen, Esq.—proposed by Dr. Spry, seconded by Mr. William Storm.

A. T. Smith, Esq. (Jessore)—proposed by Mr. F. Lowth, seconded by the Secretary.

G. Shearwood, Esq.—proposed by Mr. W. P. Grant, seconded by the Secretary.

L. Quantin, Esq.—proposed by Dr. Spry, seconded by Mr. William Storm.

John Curnin, Esq.—proposed by Dr. Spry, seconded by Mr. William Storm.

Lieutenant Kittoe,—proposed by Dr. Spry, seconded by Mr. W. Storm.

James Hume, Esq.—proposed by Mr. C. Huffnagle, seconded by the Secretary.

Lewis Durup de Dombal, Esq.—proposed by Mr. J. St. Pourçain, seconded by Mr. H. Piddington.

Michel Durup de Dombal, Esq.—proposed by Mr. J. St. Pourcain, seconded by Mr. H. Piddington.

PRESENTATIONS TO THE SOCIETY.

LIBRARY.

1. Six copies of the Proceedings of the American Philosophical Society, Nos. 1 to 6—*presented by the Society.*

2. Flora de Filipinas, segun el sistema sexual de Linneo. Por el P. Fr. Manuel Blanco Augustino Calzado—*purchased by the Society.*

MUSEUM.

1. Eight packets of Fruit and Flower Seeds from Caubul—consisting of stones of the best sorts of Apricots from Candahar, weighing from 10 to 15 to the lb. Caubul Cherries about 14 to the ounce without stalks, large Red Plums 14 or 16 to the pound, from Ghuzni, Melon Seeds, Grapes, large sorts, Quince, Apple, and Pear Seeds, and three papers of China Asters—*presented by Colonel Smyth.*

2. A specimen of cloth impregnated with a solution of Caoutchouc in Linseed Oil and Turpentine, which after being tested for twelve hours with water was found to be quite impervious to its influence—*presented by Mr. Linton of the Government Dispensary.*

3. A paper of Madia Sativa and English Linseed—*presented by Dr. Falconer.*

4. A quantity of Maize, grown at Dum-Dum—*presented by Lieutenant Burnett of the Artillery.*

5. Two plants from the Deccan called in Southern India “Wondee;” the tree is described to be superior to the Lechee and the fruit very luscious—*presented by Mr. Chew.*

6. Specimen of Cotton grown in the Sunderbunds—*presented by Mr. Hurris.*

7. Specimen of Assam Caoutchouc—*presented by Geo. Pratt, Esq.*

Report on Agricultural Grains submitted at the last Meeting.

The two samples of Wheat from the Nerbudda valley submitted to the Agricultural Committee for report have been pronounced superior to any that the members have ever before seen in this country. They both weighed full sixty pounds to the bushel. The white Til is also pronounced good, and a distribution of the seed is recommended for sowing.

Communication on Cotton Seed and the state of Agriculture in Upper Scinde.

The first communication which was submitted to the Meeting was one to the Secretary from the Honorable Sir Edward Ryan the President of the Institution, dated Allahabad, September 8th, 1839. The Honorable President mentions that a letter had just been received by him from His Excellency Sir Henry Fane, who alludes to the published proceedings of the Agricultural and Horticultural Society for June, and states that he was not before aware of the failure of the President of the Board of Trade in England to carry into effect the wishes of the Society relative to American cotton seed. That by the next packet he will transmit to him (the President of the Board of Trade) the last paragraph of page 45 and the second paragraph of page 56 of the report*.

Sir Henry mentions that the Cotton appeared to him a very flourishing plant wherever he saw it during recent marches in Upper Scinde. He states that the finest sugar-cane that he has seen in India was in that country south of Roree. That he had no opportunity of ascertaining whence it came. That several large plots of it were cultivated with great care. Sir Henry further mentions that there had not been rain in Scinde for three years, and that more is done by irrigation from the Indus than he had ever seen *any where*. The water from the river is conveyed far into the interior by deep canals, whence it is raised by Persian wheels and distributed with much skill over the surface of the soil. Sir Henry adds that the process was very interesting to an Agriculturist, and the President thinks that these particulars cannot fail to interest the Society, coming from one whose practical skill and knowledge on such subjects is so extensive.

Intelligence regarding the Fruits of Caubul and the varieties of different Seeds.

The Secretary submitted a communication which he had received from Colonel Smyth, dated Caubul, September 7, forwarding to him different kinds of fruit seeds including Grapes, Cherries, large red

* These paragraphs refer to the Secretary's "Summary" which was forwarded to the Bengal Chamber of Commerce and subsequently published in the Proceedings for June.—*Secretary*.

Plums, Apricots, Melons and China Asters. Although seedling fruit trees seldom prove good, yet Colonel Smyth mentions that as some do, it is worth a trial till the Society is able to get down grafts which Colonel Smyth thinks that no time should be lost in accomplishing. It might be easily managed through the civil authorities, and as Colonel Smyth had Firs, Cedars, Poplars, Cherries, Barberries and Apricots at Barreilly, transplanted from the Hills, and conveyed some of them to Neemutch where he left them thriving last October, Colonel Smyth does not see why they should not be introduced into Bengal where the climate is so much more mild. It is the great heat of the hot winds that kills these trees when growing. Although they come from a cold climate they do not require great cold to make them thrive.

In Malwa and Meywar where the climate is mild, Colonel Smyth is convinced that Europe trees will thrive. The China Aster is the only flower that Colonel Smyth has seen at Caubul worth sending. They have a large, and many of them double flowers. In color they are white, purple, dark pink and light pink.—Colonel Smyth states he has been disappointed in the Apples, but the Pears are very fine, so are the Cherries; grafts from these as well as from vines which bear remarkably fine Grapes should be forthwith obtained. The Melons are *most delicious*.

State of the Crops in Upper India—Importance of introducing Foreign seed-corn into India, and the enlargement of the present Botanic Garden at Saharunpore and the re-establishment of the former Hill garden.

Mr. George Henry Smith of the Civil Service, at present residing at Mussouree, in a communication dated Sept. 5th, writes in approbation of the conduct of the Society in voting a sum of money for the purpose of introducing foreign seed-corn into India, and mentions that the last Rubbi* crop in the Upper Provinces was most promising and an abundant harvest was anticipated. The hopes of the farmers however were disappointed—an universal blight having occurred a few days before the corn was ripe, and the grain when thrashed out was shrivelled up to such a degree as to give a return in most instances not equalling one-half what was expected.

Oats thrive remarkably well in the Upper Provinces, and Mr. Smith states that he never saw a finer shew than was presented this year

* Spring harvest crop.—*Secretary*.

at his farm in the Dhoon where there were about one thousand beegahs grown. Mr. Smith has only met with one description of oats in the Upper Provinces, and it appears to him to be much inferior to the finer sorts grown in England.

The finest wheat that Mr. Smith ever saw in his life is what is grown in a district of Caubul named Huyarah. A small supply had been received by Dr. Falconer, and distributed in various directions, but although it grew most luxuriously and gave promise of turning out well, not a single grain came to perfection, the whole of the plants having been destroyed by the blight already alluded to.

Mr. Smith communicates the gratifying intelligence that the Court of Directors has sent out by some of the late Overland Packets a variety of seeds to Dr. Falconer, the Superintendent of the Government Botanic Garden at Saharunpore, and amongst these some of the Barbary wheat which has been noticed by the Society. Several of the seeds have vegetated and Mr. Smith hopes in a few years to see most of the most popular of the European fruits introduced into the Upper Provinces. Mr. Smith knows of no place in India so well calculated for agricultural and horticultural purposes as the Dhoon, where he is glad to hear that Government is about to establish a garden. It is thought by Dr. Falconer and other scientific persons that the climate and soil of the Dhoon is admirably adapted for the growth of the Tea plant, and Mr. Smith understands that two boats loaded with Tea plants are now on their way up the Ganges, a portion of which will probably find their way to the experimental farms and gardens now established in the Dhoon.

Mr. Smith recommends the introduction generally of the American Maize into the Dhoon, in consequence of experiments already made on rather a large scale proving that it is superior to the country kind in every respect.

Mr. Smith concludes his very interesting communication by mentioning that he feels assured that the Society will be glad to hear that Government has sanctioned a considerable increase to the establishment of the Saharunpore Botanical Garden, which Lord William Bentinck's niggardly policy reduced, and have moreover ordered the re-establishment of the Mussouree Garden, with a recommendation to the Court of Directors that the salary of the Superintendent (Dr. Falconer) be placed on a footing more commensurate with that gentleman's distinguished abilities and scientific attainments, such augmentation to have a retrospective effect in consideration of the valuable

services which he for years past has devoted gratuitously to the promotion of botanical objects and other scientific pursuits.

An expected new consignment of Fruit trees from the Government Botanical Garden at Saharunpore—Progress made by the Court of Directors in furnishing supplies of seeds for introduction into India.

The Secretary next submitted to the Meeting the pleasing intelligence conveyed in a letter to his address from Dr. Falconer, Superintendent of the Saharunpore Botanic Garden, that he intends to make up for the loss sustained by the Society in the last consignment of fruit trees owing to the negligence of the boatmen, by preparing another early despatch, and states, that Messrs. Gibbon and Co. of Meerut, have with great liberality offered through Mr. Cope, a scientific Botanist at Meerut, to freight a boat at their own expense with a fresh collection of plants.

The Court of Directors have already in pursuance of the arrangements alluded to in the despatches published by the Society, commenced sending supplies of seeds, &c. and from the services of so zealous and accomplished an Agent as Dr. Royle, having been engaged for the home management, Dr. Falconer considers that the best results may be expected very shortly. Some bulbs sent by the June Mail, reached the Saharunpore Garden in excellent order. Another article in the package was the *Madia Sativa*, a South American plant, which has been cultivated lately to a great extent in Germany, "and found to be the richest oil seed known in Europe."

By the same dawk Dr. Falconer sends a small quantity*.

A supply has been furnished to Captain Kirke in the Dhoon and to other parties. Now that the oil producing seeds are likely to be of so much importance in Indian commerce, it will be a matter of much interest, Dr. Falconer considers, to ascertain the value and productive qualities of the *Madia*. Dr. Royle, who communicates the above about the cultivation of the plant in Germany, refers Dr. Falconer for an account of its growth to Vol. XV. p. 142 of the *Gardener's Magazine*, and Dr. Falconer recommends the subject strongly to the notice of such of the Members of the Society as are interested about Indian oil seeds.

* The Secretary announced the receipt of the seeds of the *Madia Sativa*, and informed the Meeting that he had distributed a portion, while the remainder he had himself put in the ground, but only one seed had vegetated.

Dr. Falconer also sends some linseeds previously received, which is not so large and fat a grain as what is cultivated in the Upper Provinces, at least in the neighbourhood of Saharunpore, with the varieties of which Dr. Falconer has instituted a comparison; and Dr. Falconer mentions the valuable fact that he finds the Saharunpore linseed to be exactly 20 per cent. heavier as a grain than the English. *Quære*,—Will the same proportion hold in the quantity of oil afforded by each kind? If so, Dr. Falconer remarks, we had better send home the Indian seed to improve the English stock!

Dr. Falconer mentions in conclusion that he can supply the Society with English white and black Mustard and Rape seeds if any be desired, as some of them will most probably be found deserving to supplant the corresponding Indian grains now cultivated. The mustards especially are much larger.

Practical Notes on the system of Cotton cleaning and the mode of purchasing Cotton in Guzerat.

The accompanying valuable practical remarks by Mr. Owen Potter, on the system of Cotton cleaning at Baroche, in March and April, 1837, were submitted by the Secretary.

To clean a large quantity of Cotton in Baroche* it would be necessary for those who undertake it to leave Bombay about the end of October so as to arrive in Baroche early in November.

The monsoon by this time is fairly over and the Pattels are able to estimate at what price they can contract for the Kupass† deliverable in March and April.

In this they are almost entirely governed by the last season being favorable or otherwise.

As Company's rupees are the only ones taken at the Government Treasuries in payment of duty on produce, the Pattels are always desirous to make their contracts payable in this currency.

The best method of placing funds in Baroche is by negotiating with the Collector, (who is always desirous of placing the Company's revenue in Bombay,) selling to him your drafts on Bombay, the proceeds of which are paid over to the drawer or seller at Baroche as soon as advice has been received of such drafts having been liquidated.

* Baroche is situated on the banks of the Nerbudda river about 28 miles from the open sea.

† Kupass is cotton with the seed.

The rate of exchange is fixed at the time the drafts are sold, and is generally about one and a half per cent. in favor of the seller. There are at present two kinds of rupees in circulation at Baroche—the Baroche rupee and Company's rupee*: it has been customary to pay for ready cleaned cotton in the former and for kupass with the latter. As the whole of the kupass comes to maturity from February to April, and the full duty must be paid upon all that is removed, Company's rupees are in great demand in those months, as the cleaners and dealers are always desirous to prepare their Cotton in time for shipment to Bombay before the setting in of the monsoon at the end of May, as no Cotton can be shipped to the southward during the three subsequent months. After April the Baroche rupees begin to come into demand to make the payments for the cleaned Cotton, and it was these circumstances that gave rise to the following exchanges during the first five months in 1837; during which season it must be borne in mind that money was extremely scarce, and as it advanced this difficulty was more generally felt by advices having been received from home of the very disastrous state of the money market, which from time to time were confirmed.

The exchange during March and the first two weeks in April was Baroche rupees $101\frac{1}{2}$ a $102\frac{1}{2}$ per Co.'s Rs. 100 in draft on Bombay at 8 days' sight. For Co.'s Rs. *on the spot* during that time Baroche rupees $102\frac{1}{2}$ a $103\frac{1}{2}$ could have been obtained. At the beginning of May, Baroche rupees 105 per Co.'s Rs. 100† was given, whilst at the same time only Baroche Rs. 99 were offered for the same currency in drafts on Bombay at 8 days' sight. The destruction of property by a serious fire at Surat made the general scarcity of money to be more felt at Guzerat than elsewhere, and on the other hand the crop of Cotton being very deficient, little more than half of that of the previous season, the amount of capital in circulation was comparatively small in this district.

In contracting for kupass, which may generally be done in December, an advance of Co.'s Rs. 5 to 8 per bhar would be required by the Pattels. A contract for kupass might be made with ten or more Pattels, each to be held responsible for the others, and encouragement held out to them by a system of rewards and punish-

* It is expected that Baroche rupees will be entirely done away with next season and that Company's rupees only will be in circulation.

† Only Co.'s Rs. 96 per 100 in drafts on Bombay at 8 days' sight, were given by the Shroffs at Baroche in May 1837.

ments to induce them to improve the kupass by a more careful preparation.

The Pattels are men of high caste in the villages, each village having a head Pattel who is responsible to Government for the amount of duty on produce grown in his " Gaum" or village. In this office the son succeeds the father, and in this manner the same family manage the affairs of one village for many generations. Their characters and standing are well known at the Collector's office; they have been always known to fulfil their contracts, and indeed they have hardly the power to evade them even were it their best policy to do so. When the kupass is ready for delivery on which you have made an advance, the Pattel gives information to that effect, and upon the contractor paying the difference between what has been advanced and the price agreed for, into the Government Treasury* on account of the Pattel with whom the contract is made, he receives an order from the Collector to the seapoy in charge of the Government Kullin to deliver such quantity of kupass, the duty on which will not exceed the payment made into the Treasury.

After it is determined what quantity of kupass is to be purchased it then becomes necessary to erect suitable sheds for cleaning it at the least possible expense, and so situated that the superintendent may be continually on the spot. To gain the latter object it would be well if he could rent a dwelling house with sufficient available ground immediately around it so as to build the required quantity of sheds to enable him to clean considerably more kupass than that which he has contracted for; for it will be found, in good seasons, that the Pattels, finding the upright and prompt manner in which Europeans transact their business, would willingly deliver to them any kupass they had on hand uncontracted for, at the market price, in preference to many of the native dealers here, whose exactions and treatment they find to be very arbitrary. The materials most available for erecting the sheds are bamboos and mats, both of which are plentiful in Baroque.

The sheds should be built entirely to surround the residence of the superintendant, the whole square having only one inlet or outlet, where a sepoy should be stationed to prevent pilferage. They are generally built about 6 feet high and 3 yards wide, open to the inside of the square; the space between the shed and the bungalow

* The duty on cotton paid by the Pattels to Government generally amounts to one-half the value of the whole, and sometimes to two-thirds of the whole value.

should be levelled and the surface hardened as usual. For an outlay of Rs. 600 in addition to the rent of the bungalow and ground (about Rs. 60 per month,) sheds sufficiently large might be erected to accommodate 150 churkas*. One churka if well worked will turn out upwards of 20lbs. of Cotton per day, so that 3000lbs. of Cotton per day might be cleaned, and, calculating that there are 80 days available for cleaning Cotton before the setting in of the monsoon, 300 candies—about 600 bales, might be prepared in this manner. It would be desirable to engage the churka workers in December for the whole season; their pay varies from Rs. 1 for every $3\frac{1}{2}$ maunds of seed they produce, down to as low as Rs. 1 for every $4\frac{1}{2}$ maunds, according to the demand there may be for their services. The seeds are the property of the purchaser and are always disposed of on terms that will defray the expense of cleaning and generally there is a gain.

One wooden screw (value Rs. 600†) similar to that used in Bombay should be shipped from thence to arrive in Baroche in February. The kupass is almost always delivered mixed with dirt, which arises from the ryots having no place to stow it in when it is taken from the plant but bury it in the ground, where it remains until the full duty is paid upon it, when it is removed for cleaning.

To separate the dirt and other rubbish from the kupass, it should be gently shaken out (*not beaten*) over bamboos tied together with coir in such a manner as not to allow the kupass, but to admit of the dust and dirt, falling to the ground beneath.

After this has been done, the kupass is left for some time spread out in the sun, and when fully warmed through the fibres leave the seed easier than in any other state; when the Cotton has passed through the churka it should then be shaken out over a fine net-work of coir so as to permit all the leaf which has been loosened in the process of cleaning to fall out. Cotton procured in this manner is called 2nd Toomul. Toomul Cotton is produced in a similar manner, but the kupass is hand-picked before passing it through the churka. The extra expense of Toomul Cotton is fully Rs. 30 per Baroche candy of 890lbs.

* The churka is a very rude machine though good in principle, and there is no doubt that a similar machine might be introduced with a better application of power so as materially to answer the expense of cotton cleaning.

† Rs. $\frac{3}{4}$ per bale—Rs. 1-2 per Candy would be saved by having the bales half proved at Baroche, independant of a saving in freight from the cotton being lighter or compressed than is now customary.

One bhar of a middling quality of kupass yielded 8 maunds 2 seers nett of clean Cotton (leafy) which is equal to 352lbs. English. This kupass was contracted for at Rs. 52 per bhar, in January 1837; the price being very high on account of it being well known that the crop of Cotton in Guzerat would be deficient. At this rate a Surat candy of 784lbs. would cost Co.'s Rs. 115 3 2½

Add packing expenses including gunney, lashing, screwing, &c.	5	0	0
Insurance to Bombay,	1	2	0
Import duty,	5	2	0
Loss of two months credit which is customary in Bombay, but not in Baroche,	2	2	0
Brokerage in Baroche,	1	2	0
Freight to Bombay,	1	2	0
Coolie hire,	0	2	0

Laid down in Bombay Co.'s Rs. 133 3 2½

It cannot always be expected, however, that one bhar will yield 352lbs. of clean Cotton. This season the Cotton has been unusually heavy upon the seed, and I believe the fairest estimate to be 7½ maunds of clean Cotton to every bhar of kupass, which is equal to 321lbs. which at the above rate would make every 784lbs.

cost,	127	0	0
Add charge	18	0	0

Laid down in Bombay Rs. 145 0 0

But when the bhar of good kupass is at the usual price of Rs. 40—the Surat candy would cost, Rs.	97	0	0
Add charges,	18	0	0

Laid down in Bombay Co.'s Rs.	115	0	0
Less duty on export	5	0	0
	110	0	0

Laid down in England 4d. per lb. and was worth, January 1839, 6½d. to 7d.

Progress of Horticulture on the Table-land of Mysore—Report of the Bangalore Horticultural Society.

A communication containing a Report of a Meeting of the Subscribers to the Mysore Agricultural and Horticultural Society held

at the Society's Rooms, in the Gardens, on 7th August 1839, was next read.

The Joint Secretary, George Gough, Esq. in his official letter mentions, that the Mysore Society is in a very prosperous condition, and that a large portion of the hitherto uncultivated ground is being laid out in Coffee trees which in Mysore is most productive. Mr. Gough states that the experiment of grafting Apples upon Loquat stocks has succeeded to perfection, and in less than half the time required on Apple stocks. Apples have also temporarily succeeded on Guava stocks. Mr. Gough also thinks it right to add that the Society at Bangalore has for the last six months thrown the Gardens open to all respectable natives without requiring them to bring tickets of admission.

At the Meeting of the Members, Major General Sir Hugh Gough, K. C. B., K. C. S., the Patron was in the chair, and a series of resolutions were passed, having for their object the advancement of the interests of the institution.

Orders for Seeds for next year's consumption.

The Secretary next brought to the notice of the Meeting, the propriety of making arrangements for the supply of seeds for next year, and the Meeting decided that he be empowered to take the necessary measures for doing so.

For the presents and communications the thanks of the Society were accorded.

COMMITTEE OF PAPERS.

The name of Mr. G. W. Johnson was added to the Committee of Papers.

MEMORANDUM.—In connection with the grant of 200 rupees for one year passed at the August Meeting in aid of the establishment of an experimental garden at Darjeling, it should be stated, that the expenses of the boat to convey the consignment of trees to Titalyah, and the wages for the two mallies for three months were ordered to be paid out of the above sum.

HENRY H. SPRY, M. D.,

Secretary.

NOVEMBER 13, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Room, Town Hall.

B. K. Robison, Esq., Vice President, in the Chair.

(Twenty Members present.)

The Proceedings of the last Meeting were confirmed.

MEMBERS ELECTED.

The Gentlemen proposed at the last Meeting were elected Members, viz.

Messrs. John Storm, M. D. Cohen, A. T. Smith, G. Shearwood, L. Quantin, John Curnin, James Hume, Lewis Durup de Dombal, Michel Durup de Dombal and Lieut. Kittoe.

FOR ELECTION.

The names of the following Gentlemen were read as candidates for election :

Dr. John Campbell, (Cawnpore)—proposed by Dr. Spry, seconded by Mr. A. Porteous.

John Thos. Pearson, Esq. Medical Service, (Darjeeling) —proposed by Dr. Spry, seconded by Mr. Trebeck.

Longueville Clarke, Esq. (Barrister)—proposed by Dr. Spry, seconded by Dr. Strong.

F. A. J. Elson, Esq. (Chittagong)—proposed by Mr. T. H. Gardiner, seconded by Dr. Spry.

H. Andrew, Esq. (Kishnagur)—proposed by Mr. Wm. Storm, seconded by Mr. D. Andrew.

J. S. Boldero, Esq. Civil Service, (Agra)—proposed by Mr. Charles Lyall, seconded by Dr. Spry.

Alfred Parker, Esq. (Firm of Mackenzie, Lyall and Co.)—proposed by Mr. C. K. Robison, seconded by the Secretary.

Robert Bluntish, Esq. (H. M. 9th Regt.)—proposed by Captain Mylius, seconded by the Secretary.

His Highness Prince Gholam Mahmood—proposed by Dr. Strong, seconded by Mr. Trebeck.

James R. Logan, Esq. (Penang)—proposed by Dr. Spry, seconded by Mr. Wm. Storm.

PRESENTATIONS TO THE SOCIETY.

LIBRARY.

1. Twenty-five copies of Official Papers, connected with the cultivation of Cotton—*presented by Government.*

MUSEUM.

1. Four bottles of Wood Oil, procured from the Forests of the Tenasserim Provinces—*presented by Dr. Helfer.*

2. A basket of ripe Oranges, received on the 10th of October—*presented by G. F. McClintock, Esq.* in whose garden they were grown.

3. A second specimen of Caoutchouc Cloth—*presented by Mr. Linton.*

4. Three bottles, one containing red solid Celery, one Cove Coss Lettuce, and one double-curved Parsley, procured in May last, from the garden at Ragley, the seat of the Marquis of Hertford, and regarded as the finest variety of their respective kinds procurable in England—*presented by the Rev. W. H. Pearce.*

5. A pint bottle containing the seed of a Plant that grows abundantly in Major McFarquhar's grounds at Tavoy, the leaf of which is somewhat like clover, grows either upright to the height of three or four feet, or creeps along the ground; appears to grow in any soil, and thrives in the hottest weather. Horses, cows, sheep, goats and rabbits are fond of it. It is cut the same as lucerne, and it springs up again. Major McFarquhar does not recollect having seen it any where before, and he considers it may be useful to those who keep cattle—*presented by Major McFarquhar.*

6. Two bags containing about 160 lbs. of Cotton Seed, from Tinnevely in Southern India—*presented by Messrs. Adam Scott and Co.*

7. Sample of the first specimen of Silk, made by Messrs. Watkins and Mendes, China Silk Reelers, from the Moonga Cocoons—*presented by Captain Jenkins. Referred to the Silk Committee.*

8. A bottle of Rum, distilled by Mr. J. Balestier, at Singapore, from skimming and molasses. Mr. Balestier is desirous of having an opinion of its quality, and it was referred to a competent authority for that purpose—*Presented by Dr. Hufnagle, on the part of Mr. Balestier.*

9. A small sample of Cotton, from Malta seed, grown in the garden of Major Ouseley, from seeds furnished by Captain Steel, who obtained them from the Agricultural Society—*presented by Dr. Wallich, on the part of Major Ouseley.*

10. Three small samples of Cotton, taken during the rains from plants in his garden at Dacca—*presented by Mr. Cooke.*

11. A few Dahlah seeds from plants affording every colour but dark blue—though there are blue and white amongst them. In the Valley of Dehra the flowers are as large as dwarf sun-flowers—*presented by Captain Barnett.*

12. A case containing 30 Penang Sugar Canes, sent for the purpose of ascertaining the opinion of the Agricultural Society as to their quality compared to the Otaheite Cane—*presented by Mr. Logan of Penang.*

13. A minute specimen of Caoutchouc* prepared from a climber abounding in the Hills of Darjeling, together with the stem, branches, and one or two leaves of the plant itself. Also the branch of a tree yielding an edible fruit of a red colour, and in flavor something like a currant. The capsule of the seed contains an oil, the fragrantcy and pungency of which is like the oil of lemons, but the latter quality is more acrid—*presented on the part of Dr. Pearson, by Dr. Wallich, who in transmitting them to the Society states, that probably the climber is an apocynous plant which Dr. Pearson will enable him to determine hereafter, and that the tree yielding the edible fruit is a Xanthoxylon or an Evodia not much unlike the Budrunga (Fagara Budrunga—Roxb.)*

* This specimen of Caoutchouc is decidedly harder and stronger than any Caoutchouc in the Museum of the Society prepared from the juice of the Ficus Elastica of Assam.—H. H. S.

The promotion and extension of the Cotton cultivation throughout India under the auspices of the Supreme Government, and application of American skill to the instruction of the Natives of India in different parts of the empire in the most improved methods of cultivating, picking, and cleaning of cotton.

The subject which first engaged the attention of the Society, was one of the deepest importance to the advancement of the wealth of India, and related to the determination, by the Supreme Government, of undertaking at the expense of the State, to instruct the people of the country in the art of cultivating the perennial Cotton plants of the western world by the agency of duly qualified American planters. The subject, as it came before the Society, is to be found in the following communication from the Secretary to the Government of Bengal in the Revenue Department.

To the Secretary to the Agricultural and Horticultural Society.

SIR,

I am directed by the Honorable the Deputy Governor of Bengal to forward twenty-five printed copies of the documents noted in the margin, and to request that you will take an early opportunity of bringing the subject of these communications under the consideration of the Agricultural and Horticultural Society.

REVENUE.

Despatch of the Hon'ble the Court of Directors, No. 4, of 1839, dated the 15th March, with enclosures. Min. of the Governor General, dated the 14th August, 1839.

2. The subject under discussion, viz. the improved cultivation of Cotton, is one, confessedly, of the utmost importance. The Society will observe that the subject has attracted the attention of the Honorable the Court of Directors, who, it will be seen from the Honorable Court's dispatch, have adopted measures with the view of obtaining from America the services of properly qualified individuals, who are to be sent out to this country, for the purpose of instructing and superintending the natives in the cultivation of the Cotton, and of teaching them the proper mode of cleaning it by machinery.

3. The Honorable Court, it will also be seen, are willing to hold out premiums, in order to promote, on the part of private individuals, the successful prosecution of the experiment which they have in view, for producing Cotton of good growth—to be cleaned by machinery.

4. The attention of the Society is particularly invited to the Minute of the Governor General. His Lordship is anxious to obtain, in furtherance of the views of the Home Authorities, the co-operation of the Society,—under whose superintendence the Governor General thinks it would be desirable to place the workmen expected to arrive here in the month of December next. This is a point of primary importance, and the Society, if willing to undertake the duty, will be so good as to favor Government with a full exposition of the plan upon which they would wish to proceed; furnishing, as far as they can, a statement or estimate of monthly expenditure, together with information on all points connected with the subject in question.

5. The Society will not fail also to take into consideration whether any and what measures should be adopted for inducing private or individual exertions towards the attainment of the object in view.

6. The Society are requested to make the best distribution they can of the Pamphlets,—of which additional copies will be supplied, if required.

I am, &c.

(Signed) F. J. HALLIDAY,
Secy. to the Govt. of Bengal.

Fort William, the 22nd Oct. 1839.

Revenue Department.

(No. 4, of 1839.)

Our Governor General of India in Council.

Para. 1. From the correspondence which has passed with your Government, as well as with the Governments of Madras and Bombay, you are fully sensible of the interest we have taken in the cultivation of Cotton, Sugar, and other articles of Commerce suited to the European markets.

2. The full and interesting information which we have from time to time received from our respective Governments has satisfied us that they are as deeply impressed with the importance of these objects as ourselves, and it has been very gratifying to us to find that the efforts which have been made in the formation of roads, the construction of canals, of irrigation and the alteration in the mode of assessment, have been felt and acknowledged by the agricultural

community, and have, to a considerable extent, especially in the article of sugar, been attended with encouraging success.

3. With regard to Cotton, although the exertions have not been less unremitting, we are aware that the success which has attended the cultivation of this article has not been so great as could be wished.

4. With a view to extend, improve and encourage the cultivation of Cotton, experimental farms, and farms subsidiary, were established; pecuniary advances made to individuals, and rewards granted to such natives as evinced zeal and ingenuity in the prosecution of the object; seed in considerable quantities, was procured from Egypt, Bourbon, the Brazils and from North America; saw-gins used with so much success in the latter country and in the West Indies were sent to India, and a gentleman* who resided for some years in Georgia and New Orleans, was deputed to superintend the working of them.

5. From the best information we have obtained from your records and from other sources, there appears no reason to doubt, although this great desideratum has not yet been obtained, that under proper management and superintendence, India is capable of producing Cotton, in quantity, to compete with the Cotton from North America, which the best Bombay Cotton (Surat) cleaned by the Churka often rivals; but to accomplish this, the following essential points have still to be gained, viz. more full information as to the most approved mode of culture, with reference especially to the selection of soil and climate best suited to several varieties of the plant and most genial to it.

More complete information and instruction with regard to the time and manner of gathering the Cotton from the pod, and cleaning it by means of machinery sufficiently rapid to produce the articles in large quantities without injury to the staple.

6. Referring to your proceedings and to the instructions which have, from time to time, emanated from us, and with reference especially to our despatch, dated 28th March, 1838, we are not aware that any further instructions for your guidance are necessary.

7. The great importance, however, which we attach to the acquirement of the knowledge, above referred to, by the Natives of India, and the right application of it by them to the attainment of the objects contemplated, have induced us to take into con-

* Mr. Metcalfe.

sideration the propriety of deputing persons to North America, with instructions to obtain full information on the subject, and, if possible, to engage parties willing to proceed to India, and duly qualified for the purpose of instructing and superintending the natives in the cultivation of the Cotton, and the proper mode of cleaning it by means of machinery; and we rely on your exertions for adopting effectual measures, and affording facilities for promoting and extending throughout India, any plans which may seem best suited to the attainment of the important objects contemplated in this despatch, so soon as you may receive the necessary information.

8. Should you be of opinion that the important objects we have in view will be further promoted by the offer of a reward at each of the Presidencies for the exhibition of a certain quantity of Cotton properly cleaned, we authorize you to offer rewards of such an amount as you may consider sufficient to stimulate parties engaged in the production to exhibit Cotton of good growth and cleaned by machinery. We are of opinion, however, that the quantity of Cotton so exhibited should not be less than 300 bales.

9. We transmit for your information copies of Memorials we have recently received from the Chambers of Commerce at Glasgow and Manchester, and from the East India Associations of Liverpool and Glasgow, on the subject of cultivating Cotton in India.

10. You will perceive that many of the statements in these Memorials have been made in the absence of correct information regarding the measures which have already been adopted, with a view to encourage the growth in India of various staple articles of commerce, including that of cotton. We have informed the respective parties that the subject would continue to receive our attentive consideration.

11. In the Memorial from the East India Association at Glasgow, our attention has been drawn to an improved Machine for cleaning cotton on the principle of the Churka, three of which are about to be forwarded by the Society to Bombay. We have requested the Association to procure for us four additional machines, two of which we propose forwarding to Bengal, and two to Madras.

12. This machine, it will be observed, is stated "to clean most satisfactorily the Kupas sent from Bombay." The experiment, however, being as yet confined to this country, we shall not be justified in giving the reward alluded to by the Society until the powers

of the machine have been fully proved, by being successfully applied near of growth, and soon after the gathering of the cotton.

We are your affectionate friends,

[Signed by two Chairs and eleven of the Members of the Court of Directors.]

London, 15th March, 1839.

Minute by the Right Honorable the Governor General.

Revenue Department. I have retained this despatch for some time in order that I might examine with attention the information which has been published from different quarters on the result of past proceedings in regard to the highly important subject to which it relates. All the value of success in introducing in India a better produce of cotton, suited for the immense manufactures of England, is fully appreciated by me; and it is fitting that renewed and special exertions being again directed to the prosecution of this national object, our measures in furtherance of them should be well considered, and be as complete and effectual as circumstances will admit. We are simultaneously laboring, with fair hopes, to secure the establishment of a profitable tea culture in India, and it will be one fortunate consequence of the state of our Chinese relations if, in respect to the production for the European market of two such valuable articles as tea and cotton, it should give, as seems probable, an active stimulus to the agriculture and commerce of this country. In no other channel can the capital and enterprize which have at Bombay been heretofore employed on the trade in opium, be now turned with better prospect of advantage than to the amelioration of the cotton produce of that Presidency, which already commands some partial sale among the English manufacturers, and affords a very promising encouragement to further persevering experiment.

2. The authorities which I have consulted on the subject are named in the margin*, and they appear to supply full and accurate

* *For India generally.*

"Reports on the culture and manufacture of Cotton, Wool, Raw Silk and Indigo in India"—printed by the East India Company, December 21st, 1836. Pages 1 to 431.

For the Bombay Presidency specially.

"The Government of India," by Sir J. Malcolm. Pages 108 to 133.

information on the condition of the cotton cultivation, and of the success or failure of the attempts made for its improvement, at the several Presidencies.

3. Before, however, I proceed to notice the conclusions which may be deduced from those authorities, it may be convenient that I should first briefly allude to the general principles by which I think that a Government should be carefully guided in its efforts to fix in its territories the growth of any better articles of produce, of whatever interest or importance, with reference particularly to some of the propositions which have been, and are likely to be, urged upon us, by parties laudably eager for the accomplishment of the great ends in view.

4. The following are the chief propositions of this nature which I find in the papers and publications before me.

1st. That there be an alteration in the rate and mode of taxing cotton lands, the rate being erroneously supposed to be a maximum one, and the amount often taken in kind; thereby "inducing* the grower to produce quantity or weight without regard to quality or cleanness."

2nd. That encouragement†, or reasonable inducement, be afforded to the influx of capital and to its application to this particular cultivation, a special mode of encouragement is indicated in "the offer† of a fitting bounty, either by reducing the assessment on lands on which foreign cotton seed is grown, or by stimulating industry by large grants as prizes."

3rd. That experimental farms be instituted, and rewards given for improved produce, or for improved machines for cleaning the cotton; this last being the great desideratum, especially as regards the cotton of Bombay—seeds to be also procured of the best foreign cottons, and freely distributed.

4th. That the transport of produce be facilitated by the formation of roads, and its preservation and shipment by the erection of suitable warehouses or sheds, and of quays at the ports of dispatch.

5. Of the first of these recommendations I need say little, as

For the Bengal Presidency specially.

Summary by the Secretary to the Agricultural and Horticultural Society of India, dated June 10th, 1839, in "Proceedings for June, 1839." Pages 33 to 59.

* Manchester Memorial.

† Glasgow Memorial.

‡ Summary by the Secretary to the Agricultural Society, page 59.

it is now the general rule and practice throughout India that the assessment on land cultivated with superior products shall be no higher than the average rate of land of similar quality, whatever the crop reared on it, and the custom of taking revenue in kind is no where retained. It is to be observed, however, that it is stated by Sir John Malcolm, in his work* before noted, that when the system of taking the revenue of cotton in kind did exist in the Gujerat districts under the Bombay Government, its effect was not to deteriorate, but from the steady attention given to the subject (the Government share of the crop being taken at a valuation in proportion to the care with which it was gathered) greatly to improve the quality of the cotton, there having been a decided falling off in cleanness since the abolition of the system. The same remark has been conveyed to me in a private communication with which I have been very recently favored by a correspondent of high authority at Bombay. "I believe (he says), that it is the general opinion that cotton is very rarely obtained now in a state of cleanness and of fibre equal to that which long ago was received by the Honorable Company as revenue in the Baroach districts." The purchases of the merchants of Bombay are, it is added, chiefly made at that place; and the agency which is in contact with the cultivators in the interior is almost wholly that of Natives, uninstructed, and thinking only of what may seem best for their immediate interests. A laudable instance, is however mentioned in the same letter, of exertions made within the last year or two for the introduction of a better system in this respect by a Parsee merchant of enterprise (named Meerwanjee Hormajee), some bales of Baroach and Surat cotton sent home by whom last year were valued at 1*d.* a lb. above the usual quality of good Baroach cotton, and 1½*d.* above the best which had been known to have been before imported from India.

6. In respect to the second of the recommendations also, I need not after the minutes recorded† by me on other occasions, dwell at any length on the conclusive objections which I feel to all artificial fosterings of the devotion of capital to particular employments by the remission of ordinary rates of assessment, or by any other systems of bounties. Such plans lead to improvident and unsafe speculations ;

* See pages 113 to 116, for details on this point.

† In 1836 and 1837, on the remissions of assessment on ground planted with Mauritius sugar-cane, &c. in Bombay.

they make the Government in a manner¹ responsible for the fortunes of individuals, and they are unjust to enterprize in every other department of exertion. It will suffice to say, that my objections to schemes of this description are as strong as they have always been.

7. The third mode suggested for assisting the object, by experimental farms or other expedients of a like strictly experimental character, by a few well-arranged honorary or pecuniary rewards, and by the importation and distribution of seeds, appears to me to comprise some of the most legitimate means of a special kind which the Government can use in aid of the proceedings of private parties or associations. I have no good opinion, especially with such limited and transient agency as we possess in India, of experimental farms, where the cultivation is to be conducted entirely by Government superintendents and servants. But an experimental superintendence and encouragement, on a carefully regulated and measured plan, of the efforts of private cultivators, may doubtless, under different circumstances, be productive of important benefit. To suitable measures of the character here referred to, I would do all in my power to secure a consistent and effective support; I shall hereafter propose to consider whether any such measures are now necessary on the part of the Government in India, in addition to those previously adopted, and in advertence to those specifically referred to in the present despatch of the Honorable Court.

8. As to the formation of roads I fear, that, however valuable a really permanent and good road unquestionably is for all purposes of national improvement, the hope of maintaining such roads, on an extensive scale, in the vast and poor territory, and unfavourable climate of India, is not, for yet many years, to be entertained, on a sober estimate of our difficulties and means; unmetalled roads in this country, though they may be a convenience at other times, are yet during the season of the rains nearly useless, while the expense of forming and keeping up metalled roads throughout our territories must be so enormous, and can so little be relieved by any possibility of re-payment, as to be apparently beyond the limits of all prudent outlay on the part of the State. The main practicable facilities for communication in India, excepting as regards a few great and permanent lines of intercourse between capital cities, to which the application of a large outlay has already been sanctioned, or is contemplated, must, I fear, for a long period be principally found in general protection against violence, in the building of bridges, in

the regular establishment and management of ferries, or other measures for assisting the passage of streams, in the clearing of hill or jungle passes, and in other like works of local convenience; happily however any impediments which can arise from the want of good roads will, for the present, apply only* partially to the detriment of our Cotton produce. For the best Indian Cotton, that of Surat and Baroach, is grown in districts close to the sea; while, in the Upper Provinces of Bengal, the Cotton of the Dooab and Bundelkund can readily be transported by our great rivers. In respect to warehouses or sheds, and quays, at the ports of despatch, they are doubtless very desirable, if not necessary; for it is remarked by Sir John Malcolm† that in the Gujerat districts there is a very short period between the date of plucking, and that of shipping the Cotton for Bombay, "it is believed the erection of buildings calculated to preserve the Cotton not exported during the monsoon would give great encouragement and increase production." But the building of warehouses seems rather the province of the private merchant than of the Government. It may, however, be very proper to inquire from the Bombay Government whether there are any local reasons which in Gujerat would render the interference of the State useful and expedient for such a purpose, as well as whether there is a want of suitable quays at any of the ports.

* The circumstances to which I have referred, in this paragraph, affecting the formation of roads in India and particularly roads to the Cotton districts, appear to have been in some measure overlooked in the following remarks from the useful work entitled "Progress of the Nation," by Mr. Porter, introduced after a passage pointing out the importance of roads for the advancement of Indian commerce.

"Good roads (he says) would be *practical at all periods of the year*, and in every part of the country. This improvement is especially needed in the Cotton-yielding districts, where the present expensive mode of conveyance upon the backs of oxen acts most injuriously."

It will at the same time be very proper that the several Governments should be called on to state, in furnishing the reports which I shall hereafter indicate, whether there be any road to their Cotton districts, the construction or improvement of which deserves particular consideration.

I would add on the subject of roads, that in the revenue settlement of the north-west provinces of the Bengal Presidency, a systematic arrangement is made for the repair and extension of the communications in the interior of districts, by a cess of 1 per cent. on the amount of the Government jumma or tax, levied and appropriated

† Work as above, } exclusively for that purpose. The disbursement of this cess is managed by a Local Committee, and it has been gratifying to me to learn that in some districts, the application of these funds is giving to natives of influence a warm feeling of interest, and a habit of co-operation for the general improvement of the country in which they reside.

9. In the remarks in the preceding paragraph, I would by no means be understood to discourage a serious attention to the subject of the improvement of our roads generally, but rather only to lament the obstacles which are opposed to success in such undertakings. I would here, however, refer with gratification to the great facility which has been extended to all intercourse by the abolition of transit duties throughout the Presidencies of Bengal and Bombay :—a boon, I trust, to be soon also conferred on the territories of Madras. From this measure we may look for the best effects in the quickening of every enterprize, which may seem to rest upon really solid foundations.

10. I may now go on to remark the results of past endeavours to improve the quality of Indian Cotton in the several Presidencies.

11. The Cotton of commerce consists of two great varieties,—one the black seed, or long staple, of which description are the American, Sea Island, the West India, and South American, the Bourbon, and the Egyptian* Cottons, bearing a higher price in the market than other Cottons, but in comparatively restricted demand,—the other the green seed, or short staple, of which kind are the Upland Georgia and New Orleans, (these forming the main source of supply to our English manufactures,) and the great bulk of the indigenous Cottons of India. Of the general value and use of these different varieties in commerce, a paper in my possession gives the following information :—“ The cotton in greatest demand for the larger portion of the manufacture in England is the bowed Georgia Cotton, which sells for 7d. to 9d. per lb. in the market. The India Cotton which most nearly approaches it, is that which sells in its present unclean state at about 5½d. and if it could be delivered as clean as the bowed Upland Georgia Cotton with a little improvement in the staple, it would sell in England at about 7d. per lb. to the extent of several millions sterling. Fine Cotton producing a higher price is only of limited demand.” The modes of separating the two kinds of Cotton from the seed are dissimilar. The Upland Georgia and New Orleans Cotton are so cleaned by the machine called “ Whitney’s Saw Gin,” which is considered to have been “ hardly† of less importance, generally, than Arkwright’s Machinery.” This machine appears to occasion some injury even to the short staple of

* Understood to have been introduced from Pernambuco seed—see p. 280, Report on Cotton, Wool, &c.

† Report on Cotton, Wool, &c. see page 9.

these Cottons, but the loss on that account is more than counter-balanced by the gain in time in the process of cleaning. To the long staple Cottons, however, this instrument is destructive by the manner in which it cuts them, and other means are employed for the purpose; those Cottons separating from the seed with much greater facility than the green seed species. A machine called a Roller Gin* is employed for the American Sea Island Cotton, and the Egyptian Cotton is described to be "separated† from the seeds by means of a machine worked by manual labour, such as is made use of in South America for cleaning long staple Cotton." The Indian Cotton is generally cleaned by an instrument called a "Churka," which answers the purpose sufficiently well, but is comparatively slow and expensive‡. Whitney's Saw Gin, so successful in America, might naturally be thought to be adapted to this short staple Cotton; but it has been unfortunately found at Bombay, from some cause, "whether§ the method of working it, or the weakness of the fibre of the Cotton," to injure the staple seriously, and some modification of this, or an altogether new machine appears consequently to be absolutely required. The Hon'ble Court, in a despatch to Bombay of March 6th, 1832, have suggested that the Saw Gin, notwithstanding its unsuitableness to the indigenous Cottons, might be used for cleaning Cotton raised in India from *American* seeds. In Bengal, the Saw Gin, for Cotton of a generally similar character, has been favorably|| reported of at Calcutta, and unfavorably at Culpee. It is with the view of overcoming the difficulty occasioned by the presumed inapplicability of the Saw Gin that the East India Association of Glasgow have recommended their improved machine for cleaning Cotton (referred to in the concluding paragraphs of the Court's present despatch), "on the principle of the Indian Churka," and stated to clean "most satisfactorily the kupas¶ sent from Bombay.

12. The total importation of Cotton into England, taking the three years**, 1831, 2, 3, varied from 288 to above 300 millions of

* Sir John Malcolm's work, page 122.

† See Sir John Malcolm's work, page 132.

‡ "The process of cleaning by the Saw Gin is 4 or 5 times more rapid than by the common Churka."—Sir John Malcolm's work, page 123.

§ Report on Cotton, Wool, &c. page 268, and see page 214.—Sir John Malcolm, page 123.

|| Report on Cotton, Wool, &c. pp. 197 and 227 to 231.

¶ Cotton with seed.

** Report on Cotton, Wool, &c. p. 19.

pounds in each year; and of this quantity the Cotton of India furnished not more in any year than 38 millions* of pounds, a large proportion of which was re-exported to the Continent, where there is some sale for inferior Cotton. In the years 1818 and 1819 the importation of Indian Cotton into England have reached as high as 86 and 62 millions of pounds, but this may probably have proceeded from merely temporary causes.

13. The great export of Indian Cotton to England is from Bombay, to which port the Cotton from Oomrawuttee and the Dekkan, which was formerly brought to Calcutta viâ Mirzapore, is now carried. Of the Bombay Cottons, those from Baroach and Surat are used, though inferior in consequence of the foul state in which they are transported in the English manufactories†, and the rest are almost entirely sent abroad again to the continental markets. The following is a general account of the Indian Cottons as saleable for working‡ up in England, “The Bengal§ may be fairly considered to be *out of use* with the British manufacturer. Surat Cotton, such as a good portion of the imports of 1817 to 1826 consisted of, (that is, good, clean, bright-colored thomil|| Cotton would always find a consumption to a certain extent, which of course would be increased, if the staple could be a little improved by the introduction of seed from America, particularly from New Orleans. The best quality of the Bombay Cottons have always been considered to be the Baroach and the Surat, which in good seasons are equal in staples to middling bowed Georgia.”

14. The first efforts of the Home Authorities were particularly directed to the cultivation of the Bourbon Cotton—but this was checked by the circumstance that¶ “the consumption of Cotton having a long silky staple is very limited, and that the demand of the British or Foreign manufacture does not require a large supply of such Cotton.” A gentleman, named Mr. Fischer, seems to have, at a recent period, found it profitable to cultivate Bourbon Cotton in the Salem

* In 1836 the total quantity imported was 406,959,059, of which from the East Indies and Mauritius 75,746,226.—Official Tables, published for Parliament, 1838, page 14.

† See notes to pp. 110 and 127 to Sir John Malcolm's Work.

‡ Paper by Mr. Hunt, Report on Cotton, Wool, &c. pp. 422, 423.

§ This includes the Cotton of Bundlekund and the Doob.

|| This signifies, I believe, Cotton of the first picking of the crop.

¶ Report on Cotton, Wool, &c. page 120.

- District* of the Madras Territories ; but this can only be regarded as the experience of a single speculator. Mr. Bernard Metcalfe, who was employed by the Court to conduct the experiments in the Madras Presidency in 1815, recorded some remarks which may be useful at this time : “ The Georgia† *Sea Island*, the Surinam‡, and Demerara, are all grown on the border of the sea, and the prime qualities only as far inland as the influence of the sea air and tide waters extend. In the Delta of the Sunderbund, and particularly the provinces adjacent, might perhaps be produced Cottons of an equally fine texture with those above mentioned, and which in England always bear so high a price. The presumption is, the attempt would be successful, provided the black seed was procured from Demerara or Georgia.”

15. In 1828§, the further prosecution of experiments was urgently pressed by Lord Ellenborough, the President of the Board of Control, and was warmly entered on by the Honorable Court, the particular object being to see by trial in many different parts of India, “ whether it might not be possible to raise some of the superior sorts of Foreign Cotton,” while at the same time the utmost possible care should be given to procuring the best specimens of the indigenous Cottons. To Bengal||, the Court specially pointed out that some “ Cotton produced in the Tenasserim Provinces was considered to be superior to any Cotton that has been imported from Bengal, and if in a perfect condition would rank in the London market with very good Surat Cotton, and with middling North American Upland.”

16. With the above objects in view, experimental farms were instituted in the Bombay and Bengal Presidencies, rewards were authorized, and Foreign seeds of different descriptions were largely imported, and distributed in different quarters.

17. The result of these trials has certainly been attended with much encouragement. “ Most¶ of the specimens which were the produce of indigenous seed, and had been carefully cleaned in the Native manner, proved of qualities which are desirable for manufacture in England : some fine samples were also raised from the Foreign seeds.” The favorable impression produced by the trials on the Honorable Court is stated in their despatch now before us.

* As above, page 246, Report of Principal Collector, Salem, May 8th, 1833.

† Report on Cotton, Wool, &c. pages 417, 418.

‡ These, it will be noticed, are long stapled Cottons.

§ See Reports as above, pages 133 to 136.—Letter of Oct. 7th, 1828.

|| Report, &c. page 147.

¶ Report on Cotton, Wool, &c. pages 11 and 12.

18. In Bombay an experimental farm, with some smaller ones subsidiary to it, was* established in Gujerat. But the Superintendent soon reported that "no improvement was to be expected from any alteration in the mode of cultivating Cotton in the Province; and the plan adopted was to let out, in the manner which I have before said that I am most disposed to approve, parts of the Government Farm to Native farmers, to be cultivated under his general direction, he reserving only a small portion of the land for the purpose of being cultivated entirely by himself with *foreign seeds* exclusively. The chief point of importance was soon seen to be a *greater care in the first gathering of the Cotton*. To this object almost alone the attention of the Government was directed in the experiments made in the Southern Mahratta country. The Superintendent in that quarter reported†, "The presence of the leaf which grows under the Cotton pod is the main cause of the inferiority of our Indian Cottons in the English market: this with other impurities gets into the mass of Cotton in the act of picking in the field, and under ordinary circumstances cannot afterwards be got rid of. The radical remedy for this is to pick the Cotton in the field with greater care, as is done in America, by carefully pulling the Cotton out of the pod, and not snatching at the pod itself, and separating the Cotton picked into two portions, one of the first quality free from leaf and dirt, and the other such as may be entangled with the leaf and other impurities." The strongest evidence to the same effect is given by all authorities‡. Mr. Hunt an English dealer says§—"It appears to me that the cause of the depreciation (of the Surat Cotton) is principally owing to the very slovenly way in which the crop is gathered from the plant, and without a thorough reform in that particular, it will be of little use introducing new seed, or increasing the expense of cultivation in other respects." This point being so material, it is especially to be regretted that the Superintendent in the Southern Mahratta Territory experienced great difficulty|| in persuading the ryots to follow a better system respecting it. And it is remarkable, that though it must have been well known at Bombay that it was by attention in¶ gathering the Cotton that the Go-

* See Report on Cotton, Wool, &c. pages 252 to 269.

† Report, page 203.

‡ See for Gujerat Report, pp. 253 and 256, and Sir John Malcolm, p. 112.

§ Report, p. 423.

|| Report, p. 262.

¶ Sir John Malcolm, pp. 113 to 116.

vernment, while it received a revenue in kind in this article in Gujerat, had so considerably improved its quality, the object appears, as has been before said, scarcely ever to have been thought worth the care of private capitalists. Mr. Lush, the Superintendent above referred to, was ultimately authorized by the Bombay Government to establish an Agency near Darwar, with a view to the purchasing, as an inducement to the ryots, their well-gathered clean Cotton, with what effect I have not the means of ascertaining.

19. Details of the valuation prices both of the indigenous and foreign seed Cotton, raised and sent home upon these experiments, are given in pages 272 and 280 of the Report on Cotton, Wool, &c. and although the injury before alluded to from the Saw Gin was very considerable, it will be observed that the prices are rated generally above the 7*d.* per lb., which in a preceding extract is mentioned as a sale value at which several millions sterling might be expected to be disposed of. Some Cotton from Egyptian seed is noted as worthy of particular attention, (it being added respecting this quality that it should be well cleaned in *the native* manner;) and the same as regards encouragement to production is said of the Cotton from New Orleans seed, and of some white seeded perennial Cotton grown in a small experimental farm under Mr. Lush in Darwar.

20. A fresh supply of Egyptian seeds, and of the machines used in that country for the cleaning the Cotton, was sent to Bombay in the course of 1836*, but the result is not reported in the papers in my possession.

21. It may be regarded, I think, as probable from the foregoing summary, that by inventions such as may be reasonably expected from European mechanical skill, the means of quickly and safely cleaning the indigenous Cottons of Bombay, in so far as regards the separation from the seed after gathering, may be attained, and that for the improvement which may be desired in *the staple* of the Cotton of Bombay, we may look with fair hope to the growth of the article from the best foreign seeds.

22. In Bengal the result of the experiments made has also been encouraging†, though it is to be remembered, regarding such results in all the Presidencies, that the growth of mere specimens is far from being a test of success in attempts to rear a produce of extensive cultivation. The Cotton of the Akra experimental Farm, the main-

* See Report, &c. pp. 283 to 292.

† Summary by the Secretary to the Agricultural Society.

tenance of which did not extend beyond three years, was in England partly by actual sale, and partly by valuation, above the specified rate of 7*d.* per lb. and good specimens from various kinds of seed have been also produced in different other parts of the Presidency. The conclusion arrived at in the paper of the Secretary of the Agricultural Society is, that the "Upland Georgia and Egyptian is the seed best calculated for introduction into the interior and upland parts of India, while the Pernambuco, Peruvian, Sechelles, Bourbon, and Sea Islands, may suit best along the line of Coast."

23. The seed sent to Madras appears generally not to have succeeded*, chiefly from a very unfavorable season. Yet the valuation at home of some small† samples of American seed Cotton, raised in the Madras Districts is satisfactory.

24. The Honorable Court have now determined to procure from America, and send to India, persons duly "qualified for the purpose of instructing and superintending the natives in the cultivation of the Cotton, and the proper mode of cleaning it by means of machinery;" and they rely "on our exertions for adopting effectual measures, and affording facilities, for promoting and extending throughout India, any plans which may seem best suited to the attainment of the important objects contemplated, as soon as we may receive the necessary information." They empower us also to "offer rewards at each of the Presidencies, of such an amount as we may consider sufficient to stimulate parties engaged in the production to exhibit Cotton of good growth and cleaned by machinery—the quantity so exhibited not being less than 300 bales."

25. It behoves us to prepare for the arrival of the individuals to be brought from America, who will be conveyed to India, if possible, by December next; and in this view, and that we may be ready to acquit ourselves of the further responsibility imposed on us by the preceding instructions, I have endeavoured briefly to abstract what has seemed to me most material in the reports of past proceedings. I shall be glad, if I shall have succeeded (though I cannot hope to have done so, otherwise than very imperfectly), in assisting the collection of materials which may enable the Governments in India to decide upon a proper course in regard to this important question. I would now suggest that a copy of the Court's despatch, and of this minute, with such further observa-

* Report on Cotton, Wool, pp. 237 to 251.

† Report on Cotton, Wool, &c. pp. 271 and 272.

tions as may occur to his Honor the President in Council, be furnished to each of the Presidencies ; and that the several Governments be requested to report their opinions, on a review of the facts above detailed, and after consulting the individuals or bodies most likely to afford useful advice, as to the best means of carrying on future experiments with the aid* of the American workmen to be now employed, and how the knowledge in which those persons must be deficient, of the languages, seasons, and agricultural habits of India may best be supplied. The particular districts the most suited for their employment should also be named, and the description of foreign seed cultivation most likely to succeed in each district. The length of time for which an experiment should be persevered in, should likewise be well considered ; for such partial results as, for instance, were derived from the Akra Farm near Calcutta, may not lead to any satisfactory conclusions. The several Governments should further report what amount and manner of reward they would propose to confer for Cotton, well gathered and well cleaned by machinery, under the discretion which has been confided to the Government of India. The local Governments may at the same time inform us how far the arrangements actually in force, whether by public or by private means, for disseminating the best foreign seeds throughout the country, are effective. In Bengal, I believe this object to be well provided for by the excellent measures and admirable zeal of the Agricultural Society of India. To that Society I consider the Government and the community to be under the highest obligations, and I would here say that I would, with perfect confidence and satisfaction, entrust the employment of the expected workmen, with the application of any expenditure which may be sanctioned by the Government, and the guidance of the further experiments to be now entered on, to their general superintendence. I would only on this point repeat my opinion, that experiments in the improvement of cultivation should be chiefly by instruction and assistance to a select number of native cultivators, instead of by any attempt to cultivate by Government agents, although a limited extent of Government cultivation may, perhaps, be found unavoidable with a view to the rearing of produce from foreign seeds, to which the ryots may be unaccustomed, and the risks of which they may be unwilling to incur.

* These men will be directed to bring with them large quantities of the best descriptions of American seeds.

26. Upon the details of future operations, I would only here state that I would be inclined to appropriate, if Mr. Blundell, on a reference which should at once be made to him, should recommend the measure, a portion of the American workmen or instructors to the Tenasserim Provinces; and that I would extend the experiments beyond Bengal, (where the peculiar Cottons which, as has been seen, flourish best near the Sea Coast might continue to be tried,) to our more distant Cotton Provinces, as Bundelkund and the Dooab, where but little effort has yet been made by the Government to ameliorate the produce.

27. It is in my recollection that Mr. Blundell has, in some private communication, referred to the heavy and long continued rains of the Tenasserim Coast as very prejudicial to the growth of Cotton; and I would wish that the opinion of competent persons should be taken at all the Presidencies, as to the effect of a regular alternation of dry and rainy seasons on the plant and its produce.

28. Reports should of course be furnished, as soon as practicable from each Presidency, of the success or failure of the machine for cleaning Cotton, which has been invented by the East India Association of Glasgow, and has been before referred to in this minute; three of these machines are said to be coming to Bombay, two to Bengal, and two to Madras.

29. Of the Honorable the Governor in Council of Bombay, I would specially request that he should submit a succinct report of the progress and result of the experiments established for the improvement of the Cotton of that Presidency since the beginning of 1836, to which my summary has traced the subject, and that he should particularly notice the following points:

1st. The success of the measures adopted under Mr. Lush or by any successor to him, in the Southern Mahratta country, for inducing the ryots to sell to him cleanly gathered Cotton and for the cultivation of the perennial or other kinds of Cotton in his experimental Farm at Seegee Hulee in Darwar.

2nd. The reasons which may have led to scarcely any measures being apparently taken by private capitalists for the desired improvement in the mode of gathering the Cotton in the Gujerat Districts, in which, on due attention being paid to this point, a good merchantable produce for the English market might with so much certainty be expected.

3rd. The result to the latest period of the introduction of the

foreign seeds into the Guzerat Cotton Districts, whether the seeds obtained from plants raised in the first place from such foreign seeds, yield an equally good description of produce as the original seeds, and whether the application of the Saw Gin to produce of such growth has any different effect from its application to the indigenous Cotton.

4th. The result from the Egyptian seed introduced in 1836, and the value of the cleaning machine sent from Egypt, for the purpose of separating the seed of Cottons of a long staple.

5th. The state of the ports in Gujerat as respects ware-houses and quays, and the occasion which may exist for any aid in regard to such buildings on the part of the Government.

30. I conclude that information on the prospects of an improved Cotton cultivation is generally diffused among the commercial communities of all the Presidencies. If there should be doubt on this point, it will deserve consideration* in what manner the Government can aid in spreading correct knowledge on the subject.

31. I will only add that, in order to save time, it will be convenient that I should transmit direct to Bombay, a copy of the Court's Despatch and of these remarks, and I propose accordingly to adopt that course.

(Signed) AUCKLAND.

Simla, August 14th, 1839.

(A true Copy,)

(Signed) T. H. MADDOCK,
Offg. Secy. to the Govt. of India,
with the Governor General.

(True Copies,)

J. P. GRANT,
Offg. Secy. to the Govt. of India.

At the conclusion of the perusal of these important documents, the momentous subject to which they referred was duly adverted to,

* I have been happy to observe from a Report of the sixteenth anniversary meeting of the Royal Asiatic Society in London, that this subject has attracted the special notice of the Committee of Commerce and Agriculture of that body. "The first article (it is stated) to which attention had been directed was Cotton," and after alluding to the details which had been collected and arranged on the subject, it is added—"The Committee looked forward to a time, when they should be able to place within the reach of the practical Agriculturist such information as would enable him to grow Cotton in India equal to that of any part of the world."

and the importance of the measures to be adopted for securing the success of so great a national undertaking were fully remarked on.

For giving effect to the wishes of Government relative to the preparation of the estimates and other details connected with the monthly expenditure of the contemplated new establishments, and at the same time that the fullest and safest practical local experience concerning the system of agriculture, the condition of the soils, the places best suited for the location of the American instructors, and the preparation of the wool for commercial purposes, may be insured, it was moved by Colonel McLeod, seconded by Dr. Spry, and carried unanimously,—“That the Society undertakes the duty specified in the 4th Para. of Mr. Secretary Halliday's letter under date the 22nd October last, and that the following gentlemen be appointed a Committee to report to the Society on the subject—with power to add to their numbers—

Francis Curwen Smith, Robert Watson, Wm. Storm, Prossonocomar Tagore, Esqs., Major Carter, Joseph Willis, Owen Potter, Charles Huffnagle, Willis Earle, G. U. Adam, D. B. Syers, Wm. C. Hurry, Esqs. and Dr. Spry.

Intelligence relative to the Fruits of Caubul: deficiency of Vegetables in Afghanistan, and the Facilities which the Country naturally affords for Sheep farming.

The Secretary informed the Meeting that the communication which he had next to submit was one from Lieu enant Nicolson at Caubul, in which that officer, considering that it might be interesting to some of the members of the Society to learn something of the far-famed fruits of Afghanistan and its other natural productions, offers his first impressions on the subject, and proposes to forward further observations as opportunities occur for doing so.

The fruits at present in season (August) are grapes of various kinds.

1. The “Bedana,” as the name implies, is without seeds, and is a small-sized yellow grape.
2. The “Kandharee,” a very large blue grape, of a fine mellow flavor, and destitute of the excessive lusciousness of most rich-bodied grapes.
3. The “Kaboollee,” a common watery white grape, pleasant in taste, but deficient in richness.

4. A small blue grape, more acid than any other variety; beside these, there are several other varieties which have not yet ripened.

Peaches are very plentiful—flavor exquisite, and larger than English ones.

Melons are all good. The perfume and flavor of one kind is exquisite.

Pears are of two kinds, the one superior to the other, but both good; opinion is divided whether this fruit or the peach is the best of the country.

Apples, Cherries, Plums, Greengages, and Mulberries are most abundant, and Lieutenant Nicolson considers that most of these fruits would do well in Hindoostan*.

Vegetables are very scarce. Cabbages, Cauliflowers, Carrots and Banguns are to be had however. The Horse-bean is very plentiful. Lieutenant Nicolson states, that the seeds of all the English vegetables would be a great acquisition for their gardens.

The horses of the country are small hardy animals, more remarkable for strength than activity, and are all capital beasts of burden. For the purposes of agriculture bulls alone are used. From the richness of the pastures the cows yield from three to four seers of milk daily. In the valleys and on the banks of rivers, where the towns and villages are always situated, the meadows produce the richest grass and clover. Lucerne too is very commonly grown as food for horses and cattle. The sheep of the country is the "Doombah" breed or large-tailed sort. This stock supplies the Afghan people with mutton, milk, curds, cheese, and "Kooroot," which constitutes their winter food, while with the skins they make their postemens or upper garments.

By degrees Lieutenant Nicolson thinks an improvement in the nature of the wool may be effected, by crossing the Doombahs with the Merino breeds; and that the gradual increase of civilization and wealth will be certain to follow the residence of the English in Afghanistan, and cause the natives of the country to discover and appreciate the superiority of the woollens of Great Britain, which the navigation of the Indus will bring to them. Once a demand for broadcloths is created they will be open to the conviction, that it will be to their advantage to exchange the Doombahs for fleeced sheep, and hair of very trifling value for wool, at two shillings and sixpence a pound. The country, Lieutenant Nicolson mentions, is a capital one

* The same opinion is entertained by Colonel Smyth. See last month's Report.

for sheep farming. Its extensive downs and seemingly barren hills abound in the slight short mosses and grass on which *Mernos* thrive best.

The dryness of the soil affords just grounds for anticipating freedom from rot ; and water, though not plentiful, is sufficiently so for watering and washing sheep. The capabilities of the country in this line are wonderful, and Lieutenant Nicolson states that land-carriage to the banks of the Indus is far from expensive. The nomadic habits of the Afghans, who may be styled a race of sheep-farmers, the resources of their country and their beautiful climate, with the absence of all jungle and beasts of prey, all point out that wool will some day prove a source of inestimable wealth to Caubul. Lieutenant Nicolson concludes his highly instructive communication by stating that all that is requisite is good government, a powerful police, and a little patience.

In connection with the interesting contents of Lieutenant Nicolson's letter, Dr. Spry mentioned he had to bring to the notice of the Meeting what he might perhaps be justified in pronouncing a discovery, as he had found in the library of the Asiatic Society the manuscript Memoir of Lieutenant Irvine, who accompanied Mr. Elphinstone in his Embassy to Caubul, and to which in the preface of his work Mr. Elphinstone makes special allusion in the highest terms of commendation.

The Memoir comprises upwards of 260 pages, of closely written matter in folio, and treats most fully of the climate, husbandry, and productions of the whole kingdom of Afghanistan, all of which Mr. Elphinstone expressly states that he left nearly untouched.

At first it was thought whether those portions bearing more immediately on the agriculture of the country could not be made available for the Transactions of the Society, but Dr. O'Shaughnessy, who was present, having offered to undertake the publication of the entire volume, in parts, in the Journal of the Asiatic Society, the book was made over to him, with the understanding that a few copies should be furnished to the Agricultural Society.

Establishment of a large Garden at Purulia in Chota Nagpore, to be cultivated by prisoners in order to supply them with food.

Captain Hannington, Political Officer in charge of the district of Purulia, communicates the intelligence of the establishment of a gar-

den at his station, and writes that this rather interesting experiment has been undertaken that the prisoners may supply themselves with vegetables. The plan has met with the sanction of the Governor General's Agent, and will probably be tried at Hazareebagh and other divisions of the Agency.

The great objection to the ration system of dieting prisoners, was that it did not afford sufficient change of food; and this defect Capt. Hannington considers will now be obviated by the garden as regards vegetables and fruits. These being obtained free of charge, the money thus saved will serve to purchase whatever extra indulgences may be thought needful. Under this system Captain Hannington thinks the ration system will be perfect*.

Transmission to the Society of Letters and Packages free of postage.

The Secretary brought to the notice of the Meeting that the package of seeds and letters transmitted by Colonel Smyth from Caubul came bearing a postage of twenty odd rupees: he made application in consequence to Government for a remission of the charge, and he had the gratification of stating, this had been conceded, and the following piece of intelligence imparted as to the course to be adopted by parties who desire in future to communicate with the Society.

"GENERAL DEPARTMENT. *Para. 2.* The correspondents of the Society should however be instructed to send all their letters on the business of the Society, under cover to the Secretary to Government in this department, agreeably to Section LXI. List No. 1 of the Post Office Rules of the 3rd August, 1837."

(Signed) H. V. BAYLEY,

Offg. Depy. Secy. to Govt. of India.

Introduction of Mango Plants from the Northern parts of India into the Algerine Territories.

The next communication made to the Meeting was one from Mr. Robison, from his brother Sir John Robison, who says that

* The success which has attended an experiment of this kind at Agra, will be found detailed in the Report of the Proceedings of the Society for August last.—H. H. S.

he has been urging some of his friends in the Horticultural Societies of Paris and Bordeaux to organise the means of introducing Mango Plants from the more elevated parts of India into the Algerine Territory, or into the South of France,—and asks to know if there would be any serious difficulty in getting down a succession of plants from the vallies near Simla, where they grow beside brambles and barberries. Sir John Robison thinks such plants would thrive at Algiers, if not in Provence; and that it would be the noblest present that the French Government could make to European Horticulture: and adds, that as M. Johnston, the Maire of Bordeaux, has engaged to make some efforts to begin the experiment, something further will perhaps be heard on the subject.

Mr. Robison stated in reference to his brother's letter, that he had sent a copy to Sir Edward Ryan at Simla, and hoped to obtain from him all the information and aid that could be procured.

Contemplated Establishment of a Museum of Natural History at Darjeling, and the Introduction of the Hive Bee there.

Dr. Pearson writes from Darjeling, that should the funds of the Plantation Society admit of it and Dr. Pearson remain at the station, he shall propose to engraft a Museum of Natural History for the exchange of specimens with other Natural History Societies; and he hopes in time that something may be done in the way of cattle, sheep, and so on.

Dr. Pearson wishes to introduce the Hive Bee at Darjeling. There are myriads of flowers and shrubs of sweet smelling savour, and he is sure that the bee would thrive. Dr. Pearson is anxious to learn if the bee of the Western Hills be the same as that of Europe, that some, either from this source or from England, may be obtained.

Establishment of a Branch Agricultural Society and Garden at Chittagong.

The pleasing intelligence has been received of the establishment of a Branch Society at Chittagong; Mr. Sconce, Collector of the District, has undertaken to officiate as Secretary, and in his communica-

tion to the Secretary he mentions that the garden ground amounts to about twelve acres of land.

Foreign Cotton seed supplied by the Parent Society have been sown.

The Seychelles and Malta seed have sprouted, and also a few Brazilian seeds. Mr. Sconce considers that the proper season for *sowing* foreign Cotton seed is the season for *saving* indigenous* Cotton, and suggests that the despatch of seeds by the Society should be timed so as to arrive accordingly. Coffee plants are also thriving in the garden, and Mr. Sconce hopes to see all these products successfully cultivated.

Dr. Spry mentioned, that he forwarded an abundant supply of Mauritius Canes to Mr. Sconce.

Acclimation of the Mangoosteen Tree in Bengal.

The Secretary next submitted a communication which he had received from Mr. Chew of Calcutta, stating that he had presented about two years ago some Mangoosteen plants to the Society, and asking to know whether they were still alive, as he had succeeded in acclimating six out of twenty which reached him from the Straits of Malacca†. They are now growing vigorously, and Mr. Chew states he shall soon be enabled to obtain a large quantity of trees of this most exquisite fruit.

Great value of British possessions on the Tenasserim Coast for producing Wood Oil.

The Secretary submitted a very valuable paper which had been forwarded to him by Dr. Helfer, who desires to draw the attention of the Society to one of the manifold productions of the Tenasserim Provinces as deserving the consideration of the European commercial community.

* The same opinion is entertained also by Mr. Dearman, Deputy Collector at Dacca and for the Province of Bengal; this course probably will be found hereafter to be correct.—H. H. S. *

† There are seven Mangoosteen plants at present in the Society's Nursery, upon the whole in good condition.—H. H. S.

Dr. Helfer says, the article that he alludes to, is the article commonly called Wood-oil, but which in fact is a balsam. According to Roxburgh, all the species of the genus *Dipterocarpus* yield this substance.

Some parts of the Tenasserim Provinces are covered with Wood-oil trees, which attain an immense size, and form one of the principal ornaments of its majestic forests. They are more abundant towards the South. The Lenny river banks to the south of Mergui, and the banks of the Pack-char river forming the boundary between the Siamo-Malay estates of the Peninsula and the British possessions, are lined with forests of these trees, which have never been yet touched for the purpose of extracting the balsam.

To obtain it a notch is cut into the tree not far from the ground, a receptacle like a basin then formed, where a fire is kept up until the circulation of the sap is directed by this artificial irritation towards that part; after which the liquid begins to ooze out, and continues so for several weeks, if the charred part is scraped away and a new wound inflicted.

The almost incredible quantity, which is obtained from one tree in the course of one season (from a full grown tree sometimes thirty even forty gallons, without materially injuring the tree it is said) is alone sufficient to draw the attention upon this production, considering that many thousands of the trees are available and hitherto totally unused.

The value of this substance Dr. Helfer considers has never been properly appreciated. The natives of the provinces use it on account of its high inflammability, mixed with dry putrid wood wrapped into palm leaves as torches, and it is the common substitute for oil or candles used as light by all classes of Burmans.

Besides this main purpose, it is used as medicine in rheumatic diseases, or as a preservative against white ants, for which purpose the posts of houses are smeared over with it.

The trees grow without branches, to a height of 60 to 70 feet, with a circumference of from 6 to 12 feet. The wood is very light and considered inferior; the charcoal made from this wood, however, is the best adapted for the manufacture of gunpowder.

In Calcutta the wood-oil is known and used, but there it is employed only for the purpose of painting ships, which, considering its value for other purposes, is truly a waste.

In extenuation of this it must, however, be considered that it is

generally imported into Calcutta in a state of great impurity, a third of it being extraneous matter, mud, charcoal, chips of wood and bark, which of course deteriorate greatly its value.

Having chemically the greatest affinity to turpentine, it can be used for the same purposes for which the fine lac varnish by oil of turpentine is employed, which throughout Europe conserves such a price that the transport of wood-oil from India to Europe as a substitute would be amply repaid.

It has the property, that when purified it resembles the fine varnishes; laid upon paintings, it covers them with a transparent fine coating, not liable to turn yellow, and dries quickly. How far it may improve when mixed with copal, sandarach, mastic or similar substances, Dr. Helfer has had no opportunity of deciding.

Dr. H. adds, that he cannot omit mentioning another application of this substance, in forming oil cloth, tarpaulings, &c. and it has been declared by naval men who have made the experiment, that the cloth respecting durability, is preferable to the patent anti-mil-dewed canvas made in and exported from England.

Dr. Helfer suggests, that it would be perhaps not amiss to send some of it through the medium of the Agricultural and Horticultural Society of Calcutta to the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland, which has for its particular aim the development of the resources of the British Indian Empire for practical purposes*.

For all the foregoing presents and communications the thanks of the Society were accorded.

HENRY H. SPRY, M. D.

Secretary.

* Dr. Helfer's suggestion has been anticipated.—H. H. S.

DECEMBER 11, 1839.

Agricultural Society of India.

A General Meeting was held at the Society's Room, Town Hall.

The Honorable Sir E. Ryan, President, in the Chair.

(Sixteen Members present.)

The Proceedings of the last Meeting were submitted and confirmed.

MEMBERS ELECTED.

The gentlemen proposed at the last Meeting were elected Members, viz.

His Highness Prince Gholam Mahommed, Dr. John Campbell, Dr. John Thos. Pearson, Messrs. Longueville Clarke, F. A. J. Elson, H. Andrew, J. S. Boldero, Alfred Parker, Robert Bluntish, and James R. Logan.

FOR ELECTION.

*The names of the following Gentlemen were read as candidates for election :

Henry Armstrong, Esq. (Civil Service, Futteghar)—proposed by Major Cartér, seconded by Colonel McLeod.

Major Thos. Robinson, (Offg. Supt. of the Bhutty States)—proposed by Dr. Spry, seconded by Dr. Strong.

Dr. J. M. Brander, (Medical Service)—proposed by Dr. Spry, seconded by Dr. Wise.

J. S. Mendes, Esq. of Calcutta—proposed by Dr. Spry, seconded by Mr. Wm. Storm.

Henry Hill, Esq. of Tirhoot—proposed by Mr. C. J. Richards, seconded by Dr. Spry.

James Macansh, Esq. (Medical Service, Burdwan)—proposed by Mr. James Colquhoun, seconded by Dr. Spry.

Archd. Drummond, Esq. of Kishnaghur—proposed by Mr. Charles Deverinne, seconded by Dr. Spry.

James Savi, Esq. of Kishnaghur—proposed by Mr. Charles Deverinne, seconded by Dr. Spry.

PRESENTATIONS TO THE SOCIETY.

LIBRARY.

1. Six copies of the Proceedings of the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland, from December 1838 to June 1839—*presented by the Royal Asiatic Society.*

2. Twenty copies of a Pamphlet on the Culture of Flax in India—*presented by Messrs. Hamilton and Co.*

3. The Cultivator; published by the New York State Agricultural Society—(four volumes folio, bound in one)

4. The American Gardener's Magazine of Horticulture, &c. for 1835-36-37 and 38, conducted by C. M. Hovey—four volumes, octavo.

5. The American Flower Garden Directory, by Robert Buish.

6. The Young Gardener's Assistant, by T. Bridgeman.

7. The Complete Farmer and Rural Economist, by Thos. Fessenden.

8. Chymistry applied to Agriculture, by J. A. Chaptal.

9. Book of Fruits.

10. A Manual on the Culture of Silk, &c. by J. H. Cobb. *

The above American Works, (Nos. 3 to 10) have been purchased by the Society, through Mr. J. J. Dixwell, of Boston.

11. Three hundred copies of the second volume of the Society's own Transactions, in Bengallee, have also been received from the Serampore Press.

MUSEUM.

1. A specimen of a peculiarly fine description of Wheat, grown in the Bhutty States—*presented by Major Robinson, Superintendent of the Bhutty States, and referred to the Agricultural Committee.*

2. Two specimens of Coffee, grown at Jumalpoore in the Sylhet District. No. 1 of last year's growth, and No. 2 of the present year's gathering. Major Garstin, who presents these specimens to

the Society, states he was struck by the luxuriant growth of the Coffee trees at Jumalpoore, at present (No. 2) covered with berries nearly ripe, and from what he can learn of them, he believes the trees were planted four or five years ago; but for the last two years no particular attention has been paid to them or the preparation of the berries. Major Garstin considers, that there is no doubt of the plant thriving well and affording an article of export to a large extent if properly encouraged. He has observed trees totally unprotected producing abundant crops.

3. Samples of Upland Georgia Cotton, grown on his Estates at Hansi—*presented by Colonel Skinner*. A very fine specimen.

4. Samples of Cotton, both indigenous and foreign, from the public garden and district of Dacca. Also specimen of soil in which the best sorts of Dacca Cotton grow, and casks the produce of the Dacca garden—*presented by Mr. Dearman, Deputy Collector, through Mr. J. P. Wise*. Referred to the Cotton Committee.

5. Samples of Vegetable fibre from two very common weeds found growing at Tavoy. No. 1, the best, the people make no use of; and No. 2, the Tavoyers use only in making fishing lines of—*presented by Major McFarquhar*. Referred to the Hemp and Flax Committee.

6. Two Cotton cleaning Machines with spare wheels, &c.—*presented by Government*.

7. Half a maund of Dundee Flax seed—*presented* by Wm. Braddon, Junr. Esq. for distribution*.

8. Six casks of American Maize and grass seeds, an American plough, a cultivator, and a common planter—*purchased by the Society*. These seeds, which are in excellent order, are ready for distribution, and the implements may be inspected as models.

9. Specimens of Cotton the produce of acclimated foreign seed grown in the Pudukota District, Chota Nagpore—*presented by Capt. Hannington*. Referred to the Cotton Committee.

10. A small sample of Coffee from young seedlings planted in his garden at Allipore in 1836, and unprotected with shade of any kind. From 100 trees 25 seers are expected to be obtained—*presented by Mr. D. W. Speed*.

11. A specimen of *Paut*, with a branch of the Hibiscus shrub from which it is obtained—*presented by Mr. Thomas Wilson through Mr. Joseph Willis*. Referred to the Hemp and Flax Committee.

Report of the Silk Committee on a specimen of Raw Silk prepared from the Moonga Cocoon of Assam, by Messrs. Watkins and Mendes, and presented to the Agricultural and Horticultural Society by Captain Jenkins.

The Honorable the President read the following Report by the Silk Committee.

Your Committee have carefully examined the specimen of Raw Silk submitted to them for inspection, and beg to offer the following report for the information of the Society.

The specimen in question may be considered as the best of several of a similar nature that have been brought to the notice of the Society; the fibre is strong and lustrous, though the thread would have been better had it been somewhat coarser; the sample may however be deemed as very promising, more especially when it is considered that it is the first specimen of this description of Silk that has been made by Messrs. Watkins and Mendes from Cocoons of very indifferent quality.

Your Committee would beg to recommend that the Manufacturers be requested to forward to the Society, specimens of this Silk prepared of various degrees of fineness, from fine to coarse and very coarse, got up in style and character as much as possible resembling the best Bengal Raw Silk, the skeins being similar in size and length of reel to those of the usual Raw Silk; and that these be accompanied with a full and particular account of the natural growth, collection, manufacture, cost, &c. of the staple.

Your Committee further recommend that the samples so prepared should be not less than 20 seers in the aggregate, and that the manufacturers be requested to forward the same with the least practicable delay; the Society adequately remunerating them for the expence and trouble which this request may occasion.

Your Committee being of opinion, from the sample now brought to their notice, that this article is calculated to become of extensive and valuable use to our home manufactories, would, in conclusion, beg to suggest, that on receipt of the samples above alluded to, the greater portion be transmitted to the Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain and Ireland with a request, that that body would be pleased to furnish the Society with reports from the most eminent silk manufacturers and

dyers, in order that the fullest information may be obtained on this interesting subject.

WM. STORM.

JOSEPH WILLIS.

C. K. ROBISON.

R. WATSON.

HENRY H. SPRY, M. D.

W. B. O'SHAUGHNESSY.

D. W. H. SPEED.

Calcutta, 7th December, 1839.

Award of the Gold Medal of the Society to Mr. Rose, for the best sample of Silk.

Mr. Rose, having forwarded the details connected with the method adopted by him in preparing his raw Silk, the Report of the Committee was read and confirmed, awarding to Mr. Rose the Society's Gold Medal.

Report of progress made by the Society in the matter of the extension of the Cotton Cultivation.

The Honorable the President of the Society brought to the notice of the Meeting the circumstances connected with the progress made in forwarding the views of Government relative to the spread of the cotton cultivation throughout India. He mentioned that the members must be aware, from what occurred at the last Meeting, that the Home Government had resolved on embarking on another experiment for the purpose of establishing the cotton cultivation throughout the empire on an improved footing ; and that the Governor General, for the purpose of carrying out the intentions of the Court of Directors, had called upon the Society to suggest the mode in which the plans of the Government should be carried into effect. His absence from Calcutta, had prevented him, as he had desired, from being present at the last Meeting, and from taking a part in the settlement of the preliminary steps that were necessary for considering this question ; but he found that the course adopted was the one which he should have recommended, namely, an addition to the present standing Cotton Committee of the names of a few Members whose practical experience in the agricultural habits of the people of

the different provinces would enable a plan to be arrived at that should be calculated to ensure the designs of Government the most perfect success ; and that besides this an application should be made to such residents in the interior whose practical knowledge would be useful. This, he said, had already been done, and he had now only to mention that as the undertaking was one of the utmost importance to the welfare of India it was desirable that the plan should not be too hastily adopted :—That the papers were now before the Committee for the collection of the sentiments of the Members, and that as the cotton cultivation was one in which he had always taken a great interest, and as active a part as his limited knowledge of the subject would admit, it was his intention to attend at the Meeting of the Special Committee, and consider with the Members of it the facts and observations which they were collecting from all parts of India, and from which he hoped a good practical scheme for the management of the great undertaking would be secured. It was for these reasons that the Committee were not prepared with their report for submission at the present Meeting.

Annual Horticultural Exhibition and Anniversary Dinner of the Society.

A resolution was passed that from the forward state of the vegetables of the season the Annual Horticultural Exhibition of the Society should be held on Thursday the 9th proximo, and that the Anniversary Dinner shall be on the evening of that day.

Members who have forfeited their rights from not paying their subscriptions.

The Honorable the President brought to the notice of the Meeting, that there were certain Members of the Society, who had neglected to pay up their subscriptions and who thereby had, agreeably to the seventh rule of the Society, forfeited their rights as Members ; although some of them had taken the fullest advantage of the privileges allowed to Members, in obtaining the various benefits which, from time to time, are offered by the Society. Repeated application, he said, had been made to these gentlemen, but without effect. A resolution was therefore passed that each defaulter should be addressed once more, and that the names of those who had not paid up their arrears at the time of the Anniversary Meeting next month should be publicly announced and erased from the list.

Information in reply to the address transmitted by the Society to the Home Authorities relative to the excess of duty exacted on East India Rum and Tobacco.

The communication which was first submitted to the attention of the Meeting was an official answer to the address made by the Society in May last, on the subject of inequality of the rum and tobacco duties.

No. 114.

To H. H. SPRY, Esq., M. D.

Secretary to the Agricultural and Horticultural Society.

Gen. Dept.
Customs.

SIR,—With reference to the representation of the Agricultural and Horticultural Society to the Hon'ble the Court of Directors on the subject of the inequality of the duties levied in this country upon Tobacco and Rum, the produce of the British possessions in the East Indies, and similar articles the produce of the British Possessions in America and the West Indies, I am directed to transmit to you for information the accompanying Copy of an Extract from the Proceedings of the Honorable the President of the Council of India in Council in the Financial Department, No. 1030, dated the 27th ultimo, and to request your attention to the 2nd Para. of the same.

I am, Sir, your obedient Servant,

H. T. PRINSEP,

Secy. to the Govt of India.

Council Chamber, the 4th December, 1839.

No. 1030.

Extract from the Proceedings of the Hon'ble the President of the Council of India in Council, in the Financial Department, under date the 27th November, 1839.

FINANCIAL DEPARTMENT,

No. 22 of 1839.

Our Governor General of India in Council.

1. We have received from the Agricultural and Horticultural Society of India a representation on the subject of the inequality of the duties levied in this country upon Tobacco and Rum the produce of the British Possessions in the East Indies, and similar articles

the produce of the British Possessions in America and the West Indies.

2. We desire that in reply you will inform the Society that the question has for some time past occupied our attention, but that an application to Parliament on the subject in the ensuing Session is contemplated.

Signed by two Chairs and eleven Members.

London, the 11th September, 1839.

Ordered that a Copy of the foregoing Letter from the Hon'ble Court of Directors be sent to the General Department, whence the Agricultural and Horticultural Society will be informed that, their representation to the Honorable Court on the subject of the inequality of the duties levied in England upon Tobacco and Rum, had been under their consideration for some time past, but an application to Parliament on the subject, was contemplated in the ensuing Session.

(A true Extract,)

(Sd.) H. T. PRINSEP,

Secy. to the Govt. of India.

Spread of Sugar cultivation at Penang, and the Agricultural capabilities generally of the Island for the production of Staples of Commerce there.

Mr. James R. Logan, who is engaged largely in conducting a Sugar plantation at Glasgow, Penang, communicates two interesting documents connected with the capabilities of the island for producing Sugar-cane, and furnishes details of the result of an experiment on a scale of several hundred acres made with different varieties of cane, and also notices many of the productions of the island calculated to be useful in commerce. The paper was transferred to the Committee of papers for eventual publication in the Transactions.

On the Resources and Agricultural capabilities of the Kingdom of Travancore.

A full and valuable account of the Agricultural capabilities of the kingdom of Travancore, by Mr. Stevenson, an Officer in the employ of the Rajah, was submitted. In this document much interesting information relative to the rich and fertile lands of Travancore is communicated, and the injurious tendency of the system of state

monopoly on all the chief agricultural products, such as pepper, cardamums, ginger, rice, and so on, lucidly pointed out. This paper was also transferred to the Committee of Papers.

Hints relative to the interchange of Plants between this country and England.

Mr. Cope, of Meerut, observing that the Special Committee of the Society had issued circulars, inviting information relative to the subject of an interchange of plants between India and England, has forwarded to the Secretary, the copy of a communication, the original of which was transmitted two or three years ago to Dr. Lindley the Secretary of the Horticultural Society of London. This paper, which contains many valuable suggestions, was referred to the Committee specially appointed by the Society to conduct this branch of inquiry.

Discriminating Duty exacted by the United States Government on Indian Hemp and other Vegetable Fibres the produce of the East.

The next communication submitted by the Secretary was a note received by him from Mr. G. B. Dixwell, an American gentleman, seeking information on the subject of the Indian Hemp called Sunn, and desiring to know the scientific name by which it is characterised, the motive for which inquiry Mr. Dixwell states to be as follows :—In the United States a very heavy duty is exacted on Hemp ; but *Jute* and *Manilla Hemp* are allowed to be landed duty free. But *Indian Hemp* (Sunn) is not more applicable to purposes for which *Russia Hemp* is used (not being susceptible of impregnation with tar) than are *Jute* or *Manilla Hemp*, yet the duty is demanded on Sunn as if it were one and the same with *Russia Hemp*. It is for the purpose of calling attention to this anomaly that Mr. Dixwell alludes to the circumstance, and thinks that if the United States Government were to put the fibre called Sunn on a footing with *Jute* and *Manilla Hemp* it would be the means of opening a new and lucrative market for this peculiar product.

Dr. Spry informed the meeting, that in his reply to Mr. Dixwell he had stated to that gentleman, that although we had the genuine hemp plant, *Cannabis sativa*, in Bengal, one of the native names of which was *Gunja*, yet the article which was ordinarily known as

Bengal hemp *Sunn*—was the production of a plant totally distinct from the hemp plant of the North of Europe or Asia, the scientific name of which was *Crotalaria juncea*. The jute again was obtained from various species of *Corchorus*, and the Manilla hemp from the plantain tribe—the *Musa textilis*.

Agricultural Intelligence from Swan River.

The Secretary submitted a letter which he had received from Mr. Yule, Secretary of the Agricultural and Horticultural Society of Swan River, in which he communicates the thanks of that Society for the supply of seeds furnished to it by the Agricultural and Horticultural Society of India, and begs to bring to the notice of the Society the great probability that the “Dhoob grass” of India would be admirably adapted for the soil of Western Australia. Mr. Yule desires to communicate, that the Local Government of Western Australia has come to the determination “that for the present or until private lands shall rise in price in the market, all crown lands in this Colony shall remain and be put up to auction at the minimum price of five shillings per acre.”

For all the foregoing presents and communications the thanks of the Meeting were accorded.

Distribution of Sugar-cane from the Society's Nursery Garden.

The Secretary announced to the Meeting that such had been the demand for Sugar-cane, since the commencement of delivery in the early part of October, that Thirty-two thousand, five hundred Canes had already been distributed to applicants, which had entirely exhausted the present stock, but that a further supply would be available in February next to those who had not yet received their proportion.

The name of Baboo Ramcomul Sen was added to the *Special Cotton Committee*.

HENRY H. SPRY, M. D.

Secretary.

REPORT

OF THE

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA,

FOR THE YEAR 1839.

Cursory Remarks. THE time has again arrived when the executive are expected to furnish to their brother members the particulars of their year's stewardship. The flourishing state of the Institution renders this duty light and agreeable, for when it is stated that the same support has been accorded to the efforts of the Society that has been experienced for the two preceding years the most sanguine will not be disappointed. The more the utility of the Agricultural and Horticultural Society of India is known, the more varied and important seem the facts and communications that pour in to diversify and enrich its stores.

This may be taken as a clear proof how the intentions of the individuals who constitute the body of the institution are appreciated by the public. Without affectation it can safely be said that every one of the measures of the Society has unalloyed good for its aim. In endeavouring, however, to measure prospectively the terrestrial expanse over which the Society claims to exert its province, the work done and to be done, leaves a fearful distance that humiliates but not dispirits.

The revival of agricultural husbandry in Hindustan. India—the improvement of her condition in husbandry—the establishment of her agricultural wealth, and the security of her happiness—these are what constitute the great objects and aim of the five hundred who are now enlisted as members of the Society. With the vast natural powers of her land what may she not be made to become? Year by year new articles of produce are brought forward, and the looker on, while he

is startled by the suddenness of the increase and the extent of the improvement, asks how came it that this was never known or done before? A culture once established here is a blessing both to the people and the state. For in India it is not as in petty principalities or islands, where the confinement, by natural limitation, is such that one culture cannot be spread without sacrificing to a certain extent that of another; thus diminishing as it were, the benefits which might otherwise be expected. But here, on the contrary, the millions of untilled acres will admit of the utmost extension, without encroaching in any way on that which may be already in progress. This is a fact of great consideration.

The advantages from English colonization in Hindustan.

Again, habits of intercourse with the superior intelligence of the English character are rendering the inhabitants yearly more and more alive and expert at the application of skill and the adaptation of scientific invention; and whenever the native working farmer can be brought to be so far enriched as to possess an *accumulated stock*, and can, without fear of oppression, from any quarter, point with safety to the hoard of materials which his husbandry has secured for him, or, in other words, when he shall be the owner of *CAPITAL* which, in times of need, he can fall back on for support till more prosperous times come round, then the regeneration of India may be said to have commenced, and the riches of her soil be considered to have been fairly and efficiently tested.

The economy of the Society.

The consideration of the foregoing subjects, to be dealt justly by, requires much more space than can be afforded in an Annual Report, interesting and absorbing as the topic is: and therefore it must be allowed to give place to matters more immediately connected with the economy of the Society. That the truth of the doctrine here advanced is, however, appreciated, the growing strength of this institution abundantly testifies, and the generous labourers in the cause of benevolence have the best testimony of their European brethren in exile to stimulate them in the exercise of their philanthropic exertions by the additional monthly aid which is continually coming in to contribute towards the good work they have in hand. What can be more satisfactory than this, and if pages were written nothing more gratifying to the members of the Society could be adduced to encourage and cheer them in their onward course.

To turn to the more immediate concerns of the Society, since the close of last year, there has been an accession of ninety-five new members. Of these 27 are civilians in the service of the Government, 22 are military and medical officers, 23 are indigo-planters or residents in the interior engaged in pursuits of agriculture, 15 are mercantile and 8 are of a miscellaneous class.

The total number of members on the list of the Society at the end of December 1838, was 411*. This with the addition of the 95 new elections makes the total number of members up to the present time, to amount to 506. From this must be deducted resignations 9, and deaths 11, in all 20, making the real number now borne on the records to be 486.

The following tabular statement affords the details more fully in comparison with foregoing periods; and, at the same time, represents an analysis of the constitution of the Society.

	In sixteen former years.	In 1837.	In 1838.	In 1839.	Gross total.	Total real number of members of all classes, after deducting lapses, at the close of 1839.
Civilians in the Service of Government,	46	41	11	27	125	115
Merchants and traders, . . .	31	36	28	15	110	105
Indigo and other planters,	25	21	42	23	112	104
Military officers in the Service of Government, . . .	34	17	18	15	84	68
Medical ditto ditto,	14	16	10	7	47	33
Asiatics,	13	9	7	1	30	26
Gentleman of the Legal profession,	14	5	1	5	25	20
Clergymen,	5	2	2	1	10	5
Honorary members,	6	1	0	1	8	6
Miscellaneous,	0	0	0	0	0	4
	188	148	120	95	551	486

Of this number 46 are members who have compounded for their subscriptions, 47 are in Europe, and 6 are honorary, leaving 387 as the actual number of paying members on the books of the Society.

* In the Annual Report for 1838 the number is stated to be 420, but this is an error.

The accession of 94 new members during the present year is a circumstance well worthy of congratulation, for after the great additions made in the year 1837 and 1838 to the ranks of membership (the circle of the European community in this country being limited), there was much reason to suppose that the Annual Report of succeeding years would necessarily present a diminished return.

When the result of the year just closed is viewed in this light the number of 94 may be regarded as a demonstration of public feeling equal if not surpassing that of any previous period.

Casualties. The calamity which the Society has sustained by the hand of death has been severely felt during the past year. Member after member, among those whose devotion to the cause led them to give their time, when it could be but ill spared, to the manifold duties required by the Society, have been taken from us. Perhaps in no year, since the foundation of the Institution in the year 1820, has the bereavement by death and departure for England which the Society has experienced been greater than during the one last passed. Messrs. George Prinsep, Ewart and Cracroft may be instanced as the most prominent of these.

George Prinsep, Esq.

The first was always foremost in promoting every measure calculated to advance the interest of the Society and the good of the country. His enterprising spirit was abundantly shown in the projection of more than one great scheme of national improvement, and the practical knowledge which he brought to bear on all points in which he engaged, gave to his opinions that weight and influence that earned confidence whenever expressed, and tended so much to the security of the reputation which the Society now enjoys. Ardent in the cause in which he embarked, he left no means untried to secure success; labour to him, in the ardour of pursuit, was quite lost sight of, and it is much to be feared that the untiring industry of his spirit, in this inclement clime, precipitated him prematurely to his grave. As one of the warmest friends of the Agricultural and Horticultural Society of India, his name stands foremost, and his loss will long be felt with regret.

W. K. Ewart, Esq.

The melancholy and distressing death of Mr. Ewart must be fresh in the recollection of the minds of every resident member of the Society. From the first moment of setting foot in India Mr. Ewart entered warmly into the advantages of Indian research. Trained to habits of inquiry he had early learnt to appre-

ciate the value of attested facts, and like all minds once so tempered, never felt contented till the truth could be elicited in her clearest form. Thus his attention was early directed to the value of statistics, and as a member of the late Statistical Committee of the Asiatic Society of Bengal, he did his utmost to impress on those who had not given the subject consideration, the importance of this department of science. He brought these great practical acquisitions with him to the assistance of the Agricultural Society, and, had his life been spared, the institution would, there is little doubt, have had many proud testimonials of his ability and worth. As it is the records bear proof of the interest which he took in that great national object—the improvement and spread of the cotton cultivation throughout the empire, and his constant attendance at the meetings of the members has caused his untimely end to be severely and deeply felt. The other members who have been taken from the Society during the past year by death are Messrs. Cockerell, Oram, C. R. Martin, Wm. Allen, George S. Hills, John Maclean, M. Maclean, F. H. Souter, and R. H. Bain.

Work done
by the Society
during the past
year.

Passing now to the consideration of the work which has been done by the Society during the past twelve months, we come first to the call made on the Society by the Government of India to furnish it, for the information of the Court of Directors and Committee of Agriculture and Commerce of the Royal Asiatic Society of Great Britain, with particulars touching the productions and prices of Agricultural articles at the chief mart and an obscure village conjointly in each district of the various provinces of the empire ; arranging the returns in such a manner that the course of trade geographically may be best shown.

Collection of
Agricultural
statistics.

The Society, ever anxious to support the acquirement of information of public utility in every form, appointed for the purpose of carrying into effect the wishes of the Supreme Government, a special Committee, from among its members, to undertake the task of inquiry,—and a report having been presented to the Society by the Committee, in which the mode best calculated, in its opinion, to attain the desired object had been set forth, the same was confirmed ; and circular letters agreeably to the plan laid down were addressed to all the medical officers at agency and zillah stations,—blank tabular forms at the same time being furnished in order to give as little trouble as possible, and also to ensure a uniform mode of return.

To the completion of such a plan of procedure much time had necessarily to be allowed, but the replies which have been sent in are so numerous and complete in their details that the Society has abundant reason to be grateful to those gentlemen, whose zeal in the cause of statistical research has induced them thus readily to come forward to promote the end in view.

The propagation of the fine grained cochineal insect in Bengal.

The second object, in point of priority, which has engaged the attention of the Society has been the introduction and propagation, if possible, of the fine-grained cochineal insect in Bengal. In the early part of the year great hopes were entertained that the insects which had been received from England and Bourbon would have lived and have spread; but subsequent experience does not enable the Society to confirm this ardent wish.

The plants have thriven well and are at the present moment in a great state of perfection at the nursery, but, owing to one accident and the other, the insects have never been landed in that state of healthful vigour or in that quantity which could be said to allow of the climate being fairly tested; and, after enduring a state of sickly existence for a few weeks, they have gradually died away till all have disappeared. The Society is now in a better condition to receive insects than ever it was before, as the *nopalarie* is well stocked with the Bourbon plant, and through the generous exertions of MM. Richard and Bedier, who have so kindly forwarded more than one consignment of insects and plants, the Society hopes to be put in possession of a further supply. As a mark of the sense entertained by the Society for the valuable endeavours of both MM. Richard and Bedier, the Society has voted to each of these gentlemen its gold medal.

Prosecution of the cotton culture in Hindustan.

The third in order, but first perhaps in importance, is the attention which the Society has paid to the prosecution of its labours in the cause of cotton cultivation in India,—an object the magnitude of which can only be measured by the millions of pounds sterling which may be said to be involved in the success or otherwise of the undertaking.

The more the Society gives its consideration to the improvement of this important culture the more it becomes convinced that capital and skill are alone required to raise the indigenous cottons of the country (the parent stock, be it observed, whence all other lands have been supplied) to a standard worthy of a comparison with the produc-

tions of the west. The accumulated mass of information in support of the fitness of the lands of India to furnish cotton from the seed of the perennial plants of the western world leave no doubt that with care in the selection of the sites, attention to the husbandry of the tree, and the skilful application of modern knowledge to the art of cleaning the article for the market, the export of cotton from India will be a business of yearly increase, and form a most material item in the future custom duties of the state.

With the conviction that the public attention alone requires to be directed to the subject, the opportunity, which the presentation of the memorial of the Manchester merchants to the Society through the Bengal Chamber of Commerce afforded, was seized of preparing a Summary, from the records of the office, of what had been done by the Society and the success which had attended its efforts at introducing American and other varieties of foreign cotton seed into India. And by the addition of an extra number of 150 copies to the ordinary number of 400, the pamphlet had as large a circulation as the Society could afford to give it.

The measure thus brought prominently forward by the leading cotton community of Great Britain was not allowed to rest dormant by those appointed to preside over the destinies of India, and hence we find that about the time the Society had its Summary in hand the Home Government of India was devising means to meet the prayer which had been embodied by the merchants of Manchester in their petition to the Honorable Court of Directors of the India Company.

The despatch conveying the sentiments of the body of the Directors bears date March 15th, 1839, and the able minute of the Right Honorable the Governor General thereon, which has been transmitted for the guidance of the Society, was completed on the 14th August, 1839. The documents themselves and the steps taken in fulfilment of the sentiments contained in them have been so recently before the members and the public that a circumstantial detail in this place is rendered unnecessary. It is sufficient to mention that the Government of India has once more determined to embark, in the most efficient manner that can be devised, in this most laudable national object; and that it has sought to ensure success by obtaining, from America, the services of duly qualified planters in order to give to the undertaking the benefit of the best practical knowledge. The arrangement of the details for carrying the resolution of the Govern-

ment into effect, the Society has been solicited to undertake, and this is now in course of preparation. That success in its most enlarged sense will attend the efforts now to be made must depend on the energy and zeal of the individuals whose province it will be to watch over and attend to the working of the enterprise. The amplest testimony exists that the diversified soil and climate of India are capable of supplying the demands of Europe with cotton of a marketable and profitable quality, and it rests with the executive to justify the expectation of what the soil can do.

Indian caout-
chouc or India
rubber.

In the rising staple of caoutchouc the Society has received and communicated during the past year, many interesting items of intelligence calculated to stimulate the application of capital to the production of this remarkable produce of the vegetable kingdom. The attention which has been directed to the preparation by men of science, has secured for the manufacturer of it much practical information ; but as yet some obstacles remain, which it is desirable should be removed. Caoutchouc obtained from the lactaceous juice of the *Ficus Elastica* of Assam is liable to decomposition, and the security of the article reaching the English market, in its solid form, is much endangered. Drs. Royle and Ure*, have for some time had the subject under consideration, and it is hoped, from the success which has already attended their inquiries, that their researches will eventually be crowned by the discovery of an efficient remedy for the evil.

The establish-
ment of Tea ma-
nufactories in
Assam.

The next most important subject which has come under the consideration of the Society is the progress made by the Government of India in establishing a manufactory of Tea in Assam. The papers and documents which have been laid before the Society incontestibly prove how capable the lands of Assam are for the growth of Tea plants, and how vastly abundant the country is in this most valuable shrub. In the management of this new and interesting branch of agricultural pursuit the Society has no concern directly, but the desire of the Government to engage the attention of the members and capitalists, generally, to the facilities which the province of Assam affords for manufacturing tea to any extent, has induced it to make, from time to time, communications to the Society on this highly important culture. In order to attract attention to the subject, the Court of Directors, both

* In a letter to the Journal of Arts, London, March, 1839.

individually and collectively, being prohibited from embarking in the cultivation as a source of commercial profit.

In their despatch dated London 26th September, 1838, they have signified to the Governor General in Council that the Government Tea establishment in Assam must not be increased beyond what is absolutely necessary to bring the trial to a fair practical issue, as they consider that when generally known, the speculation will doubtless be taken up with avidity by the commercial capitalist. And again in their despatch of January 23, 1839, they desire that the best means for encouraging the cultivation of the Tea with as little present loss to Government be suggested with as great prospective benefit to commerce as possible. Already the surmise of the Honorable Court has been fulfilled. A joint-stock company to undertake the severe and hazardous task of bringing the Tea colonies of Assam into cultivation has been formed with a capital of a million sterling, and the Society hails the formation of it as an undertaking that requires the most liberal consideration of the Government, as if successful, it will be one of the grandest achievements that private enterprise has ever effected for the good of India.

Improvement
of the indige-
nous cattle of
India.

As a material branch of Indian husbandry the improvement of the present impoverished bullock of the country has attracted the notice of the Society, and in April a full report was brought up from the Cattle Committee and adopted, having for its object the introduction of the middle-horned bull of England into India, and a schedule of prizes on a most liberal scale as an inducement to the public to undertake the introduction of good neat and other cattle into India has been held out.

Oppressive
discriminating
duties on To-
bacco and Rum.

One of the difficulties which Indian Commerce has hitherto laboured under, has been the invidious distinction made by the legislature of the mother-country between staple articles the produce of the British possessions in India and similar articles the produce of the Crown colonies; until within the last three years a distinction of this kind was made between the sugars of the East and West Indies, and it yet continues to be in force with respect to the two commodities of Tobacco and Rum.

To assist, by every legitimate means in its power, to remove so impolitic, to use no stronger expression, distinction, the Society in May last determined on drawing the attention of the constituted authorities of the state to the burthen thus unfairly thrown on the energies of

the country, and therefore moved the various organs of the Government to obtain from the legislature of England a removal of these discriminating duties. The Society trusts that its labour has not been in vain. The receipt of a recent despatch from the Court of Directors, in reply to the representation of the Society, intimates that that influential body has a petition to the imperial Parliament in preparation with which it purposes going to the legislature on the first Meeting of the Session.

State measures for conducting an interchange of vegetable productions between Europe and the East Indies.

The Society in June last, had placed at its disposal a despatch from the Home Government, addressed to the Governor General of India in reference to a communication which had been transmitted by him touching the importance of an interchange of vegetable productions, and intimating to His Lordship that the Court had resolved on gradually furnishing the means of carrying on, extensively, experiments for naturalizing in India, useful and desirable plants indigenous in other countries.

On the receipt of the communications here adverted to the Society lost no time in constituting a Committee for the purpose of assisting the Government in the prosecution of its views. The recommendation adopted was to issue circulars to all persons scattered over the country, inviting them to furnish the Committee with the extent of their individual knowledge. This has since been done, and the Society purposes to continue to render its services to the promotion of this laudable work with its best ability.

Introduction of Foreign seed corn into India.

Another object of solicitude by the Society, during the past year, has been the introduction of Foreign seed corn into India, and for this purpose a sum of money has been voted to enable the Society to commence this desirable object, and an invitation issued to all persons who may be desirous of trying the benefits likely to result from this measure, to register their names at the office of the Society, and any quantity they may require shall be obtained for them from the seedsmen of the Society.

Spread of Sugar-cane cultivation throughout Hindustan.

Turning now to the consideration of the efforts made by the Society in extending the propagation of the Sugar-cane in India, in order to contribute the best aid in its power to forward the interests of the nation in the promotion of this great necessary staple of commerce, the Society has the pleasing duty of noticing that such has been the avidity

shown by the members and others to possess the valuable varieties of cane grown in the Nursery of the Society that in the space of six weeks from the commencement of the distribution not a cane was left for tardy applicants. The stock supplied amounts to 32,494 canes, and these have gone forth into the different districts of Bengal to meet the growing demand which exists for this profitable and valuable culture. A further crop of cane is expected to be ready for cutting in February, when applicants can again be supplied.

Branch Societies. At the close of last year, the Society had to report the existence of fourteen Branch Societies. During the year just closed an addition of four, Backergunge, Darjeeling, Chittagong and Bauleah, has to be made to this number, making in all seventeen of these most valuable aids to the diffusion of the great designs which it is the object of the Parent Institution to disseminate.

Prizes awarded by the Society. In the Department of rewards for the encouragement of the great objects adverted to in the foregoing paragraphs, the Society has to report the adjudication, at the annual exhibition held in February last, of the large Silver Medal of the Society and 250 rupees to Mrs. Pattle for the best bred Cow.

For Cattle To W. F. Gibbon, Esq., the Gold Medal of the Society and 200 rupees for the best Woolled Merino Ram.

To W. F. Gibbon, Esq., the large Silver Medal and 150 rupees for the second best Woolled Merino Ram.

For Cochineal. In consideration of the readiness with which Mr. Bedier, Minister of Marine at the Isle of Bourbon, has met the wishes of the Society in promoting the introduction of the fine-grained Cochineal Insect into Bengal, the Society has awarded to that gentleman its Gold Medal.

For bringing the Cocoons of the Eri silk into use. As a means of contribution to the liberal donation of Captain Jenkins, Commissioner of the Assam Provinces, to promote the discovery of an efficient method of bringing the cocoons of the Eri silk worm into use as an article of commercial value, the Society has determined to meet Captain Jenkins' donation of 500 rupees by a similar amount, and a schedule of prizes to the extent of 1000 rupees is now before the public for the purpose of encouraging the discovery.

For Raw Silk. In the article of silk the Gold Medal of the Society for the second time has been awarded to Mr. Rose of Ramnaghur Factory in the collectorate of Moorshedabad. On this occasion there were six competitors.

For Sugar. To J. Balestier, Esq., American Consul at Singapore, the Gold Medal of the Society has been awarded for affording a strong-grained useful sugar which would answer well for refining; and which has been classed as brown to good brown.

Money vote for Foreign seed corn In order to carry out the intentions of the Society in procuring the introduction of Foreign seed corn into Hindustan, the sum of Five Hundred Rupees has been appropriated for that purpose.

Money vote for purchase of Cotton Seeds. In the way of outlay for Cotton seed the Society has appropriated the sum of 500 rupees for the purchase of the best sorts of indigenous seeds, and 1000 rupees for the purchase of American seeds. The assignment of further sums has been unnecessary, owing to the liberality of donors, who in a spirit of noble generosity, have preferred that their consignments of seeds to the Society should be received as a gift rather than be paid for. To Mr. Waghorn of Egypt, Mr. Jackson of Calcutta, Messrs. Arbuthnot and Co. of Madras, Mr. Richards of Calcutta, Mr. G. U. Adam of Calcutta, Messrs. Adam, Scott and Co. of Calcutta, the thanks of the Society are especially due for the extensive and most acceptable presents of Foreign Cotton seeds which they have made.

Literary Department. In the literary department, the Society has to call attention to the alteration which has, for the past year, been made in the manner of giving the various important communications, as they come before them, as extended a form of publicity as possible, by enlarging the monthly Report of Proceedings. Much of the present popularity, which the Society enjoys, may be traced to the valuable information which, from time to time, is given to the world, while the subject is fresh and acceptable to the public. In this way the intelligence, which the Society is favored with has been disposed of, and in the forthcoming volume of Transactions the reader will, in consequence, find that all the shorter essays and contributions have been recorded in the Reports of Monthly Proceedings. Papers of more lengthy size and which could not, without extending the Monthly Report to undue limits, be so disposed of, have been reserved for the body of the Transactions, and these are now in course of preparation at the press.

Horticultural Department. In the Horticultural Department the Society has every reason to be satisfied. Seeds have been distributed, to a large extent, all over the country. Of the excellence of the Calcutta market in all the varieties of culinary vegetables, the

daily supply in all the chief market places of the city is an incontrovertible proof, and to the Society is this state of perfection and plenty mainly due. By furnishing the native gardeners with foreign seed at half price, they are able to furnish every year a continued supply which, without this assistance, they could not do, as many of the vegetables, although they grow luxuriantly, give little or no fruitful seed.

The Annual Horticultural Exhibition of the Society further contributes towards the encouragement of this useful object, by the award of medallion and money prizes, and the Society has reason to believe, that these are much sought after by the class of persons for whom they are intended.

Conclusion. In conclusion the Society has to present, for the information of all concerned, the particulars of the different objects for which prizes are held out, and it is hoped that the review of the labours of the Institution for the past year now given, will afford that satisfaction that shall earn for it the continued support of the members and the influx of new and additional support.

The Agricultural and Horticultural Society of India being desirous of effecting the introduction of *Foreign Seed Corn* into India, are prepared to receive and register applications from any persons who may be desirous of procuring Seed for trial in their lands: and will use their best endeavours to obtain the same from Europe, Africa, and America. It is requested that individuals will furnish a reference in Calcutta for the amount of their orders, which will be supplied at invoice cost price.

EXHIBITION OF PRIZES.

ERI SILK.

The Agricultural and Horticultural Society, in conjunction with Captain Jenkins, the Governor General's Agent in Assam, beg to call the attention of the public to the following notification:

1st.—To any person who may succeed in discovering an effectual and cheap solvent for the adhesive material which attaches to the Cocoons of the Eri Silk Worm,—so that the Silk can be made useful to commercial purposes;—

THE SOCIETY'S GOLD MEDAL AND 200 RUPEES.

2nd.—For the best and most economical mode of preparing Floss, and also the manufacturing of a fine thread from the floss of the Eri Cocoons ;—

THE SOCIETY'S GOLD MEDAL AND 200 RUPEES.

3rd.—For the best and most economical method of bleaching Cloth manufactured from the Eri Cocoon, so as to take permanent and fugitive dyes well ;—

THE SOCIETY'S GOLD MEDAL AND 200 RUPEES.

CONDITIONS.

No Claimant to any of the above rewards shall be entitled to the prizes, till they have furnished the Silk Committee with the fullest particulars of their discovery ; and the Society further reserves to itself, the right of withholding the award of prizes till the experiments of the Claimants have been tested on an efficient scale.

FOR STAPLE PRODUCTIONS.

The following Prizes are offered to the producers of the best Samples of the undermentioned Staples of the Bengal Presidency, agreeable to the resolution of the Society, passed at a Meeting held on the 14th November, 1838.

SUGAR.

1st.—For the best Sample of *unrefined* Sugar, not less than 2 maunds, *The Gold Medal.*

For the second best Sample of *unrefined* Sugar as above,..... *The Silver Medal.*

SILK.

2nd.—For the best Sample of Silk, not less than 2 seers,..... *The Gold Medal.*

For the second best Sample of Silk, as above,.. *The Silver Medal.*

COTTON.

3rd.—For the best Sample of Cotton, raised from Foreign Seed, not less than 2 maunds, *The Gold Medal.*

For the second best Sample of Cotton, raised from Foreign Seed, as above,..... *The Silver Medal.*

TOBACCO.

4th.—For the best Sample of Tobacco, reared from Foreign Seed, not less than one maund, *The Gold Medal.*

For the second best Sample of Tobacco, reared from Foreign Seed, as above, *The Silver Medal.*

CONDITIONS.

1st.—The articles exhibited by Candidates for Medals, must be the produce of Bengal and the North Western Provinces.

2nd.—The competition will be open to all persons whatever without distinction.

3rd.—The articles must not be gatbled, but bonâ fide the average produce of the land on which they are grown, or of the manufacture.

4th.—All Candidates for Medals must deliver with their specimens, statements of the places at which the articles were produced, the quality or nature of the soil and of the mode of cultivation and manufacture, and the cost of production.

5th.—A moiety of the specimens which shall be declared entitled to the *Gold Medals*, shall be the property of the Society, the remainder will be returned to the Candidates.

6th.—Candidates are requested to affix to their specimens, a number or mark, and to accompany them with a sealed letter and to mark the letter addressed to the Secretary with the words ‘Competition Letter,’ which letter will remain unopened till after adjudication.

7th.—When two or more Samples shall be considered to be of equal quality, the Medal will be awarded to the sample which may appear to have been raised at the least cost, and with reference also to the greatest quantity produced upon a given area.

8th.—All Candidates are expected to have their specimens in the possession of the Secretary of the Society, on or before the 1st May 1840.

 FOR CATTLE.

In accordance with the vote of the Society, at a Meeting held on the 10th April, 1839, the following Schedule of Rewards for Cattle of various kinds to be exhibited at the Annual Show on the 1st of February next, was passed.

IMPORTED NEAT CATTLE.

1st.—For the best imported Bull of the year 1839, not less than two years old,—a Premium of 500 Rs. and the Gold Medal.

2nd.—For the second best imported Bull of the year 1839, not less than 2 years old,—a Premium of 400 Rs. and the Silver Medal.

The same for the year 1841.

NOTE.—(A preference will be shown to the Devonshire or Middle-horned Bull.)

PRODUCE.

3rd.—For the best produce of imported Cattle,—a Premium of 250 Rs. and the Gold Medal.

4th.—For the second best produce of Imported Cattle,—a Premium of 200 Rs. and the Silver Medal.

5th.—For the best *Bull Calf* of any denomination calved in 1839,—the Gold Medal.

6th.—For the best *Cow Calf* of any denomination calved in 1839, the Silver Medal.

SHEEP.

1st.—For the best imported Woolled Merino Ram of the year 1839, not less than two years old,—a Premium of 200 Rs. and the Gold Medal.

2nd.—For the second best imported Woolled Merino Ram of the year 1839, not less than two years old,—a Premium of 150 Rs. and the Silver Medal.

The same for the year 1841.

3rd.—For the best pen of Merino Ewes to the number of six,—a Premium of 100 Rs. and the Silver Medal.

4th.—For the best thorough-bred Merino *Ram Lamb*, lambled in 1839,—the Gold Medal.

5th.—For the best thorough-bred Merino *Ewe Lamb*, lambled in 1839,—the Silver Medal.

6th.—For the best lamb, either Ram or Ewe, cross of a Merino Ram and an indigenous Ewe, lambled in 1839,—the small Silver Medal.

CONDITIONS.

1st.—The competition is open to Stock from any part of the world.

2nd.—The pedigree and age of the Stock, so far as known, must be given.

3rd.—The Committee of the Society appointed to conduct the arrangements for the Show, will appoint skilful persons to act as judges.

4th.—The Committee reserve to themselves the right of withholding any of the above rewards, should the numbers of either class brought forward be insufficient, in their opinion, to establish a legitimate competition, or in the opinion of the judges, from inferiority, not be deserving of a prize.

PREMIUMS FOR WORKS ON AGRICULTURE AND HORTICULTURE.

It having been resolved upon, at a Meeting held on the 12th April, 1837, that Premiums should be offered for the best works on Indian Agriculture and Horticulture, the following Resolutions, passed on that occasion, are advertised for general information.

1st.—For the best work on Indian Agriculture in all its branches, founded on experience in the country, to be presented to the Society on or before the 1st May, 1840,

TWO THOUSAND RUPEES.

2nd.—For the best work on the Agriculture of Bengal, to be presented to the Society on or before the 1st May, 1840,

ONE THOUSAND RUPEES.

3rd.—For the best work on the Horticulture of the Western Provinces, to be presented to the Society on or before the 1st May, 1840,

ONE THOUSAND RUPEES.

CONDITIONS.

1st.—The Society reserves to itself the right of refusing to grant any of the above Premiums, if the works on the above subjects are not such as it approves.

2nd.—The Authors who may receive any of the above Premiums, shall, within six months after the receipt thereof, publish the Treatises to which such Premiums shall have been awarded, or the Society shall have the option of publishing, in case the Authors shall neglect to do so within the time above prescribed.

HENRY H. SPRY, M. D., *Secy.*

Proposed by Dr. Wallich, seconded by Mr. Piddington, and resolved, that this Report be adopted and printed.

COLLECTOR'S REPORT

FOR THE YEAR 1839.

By direction of the Finance Committee, I beg to submit a Statement of the total Receipts and Disbursements of the Agricultural and Horticultural Society of India, during the past year, exhibiting with the former balances, a total sum credited of Rs. 23,736 14 7 and a total sum disbursed of, 23,188 2 6

Although the amount received during the past twelve months shews a great increase on the collection of the preceding years, yet the sum expended has been greater than ordinarily, arising principally from the following causes :—

1st.—The amount of the usual supply of vegetable and flower seeds received from the Cape, England and America, greatly exceeds that of former years, with reference to the increased number of members, and thus causes a difference, as compared with the year 1838, of upwards of twelve hundred rupees.

2nd.—The advance on account of American Cotton seed, and the purchase of a supply of Dacca Cotton seed for transmission to Assam, add considerably to the amount of expenditure ;—it had been determined by the Society that these items should be defrayed from its fixed assets, but this measure has been obviated by the balance of current receipts being found sufficient to meet this charge, amounting to Eleven Hundred Rupees.

3rd.—The reprint of the three first volumes of the Transactions of the Society, has involved an additional expense,—against which, however, is to be placed the extra number of copies (three hundred of each volume) now in hand and available at cost price to members of the Society.

4th.—The expence incurred for *Agricultural* seeds from America, for Fruit trees from England, and for various Agricultural implements, received during the past year, forms a new feature in the accounts of the Society ;—the total sum disbursed under these heads exceeds three hundred rupees.

5th.—The donation to Mrs. Bell also forms an extra item of account.

To enable the Society to meet these additional expences, it has been deemed expedient to obtain a temporary loan from the Bank of Bengal on deposit of Company's Paper, which accounts for the amount of fixed assets being less than that exhibited in the Statement submitted for the year 1838;—this course was considered preferable to selling any portion of the Government Securities, it being probable that from the collection of the current year, a sufficient sum will be accumulated to enable the Society to redeem this loan.

This is the result of the financial operations of the Institution during the past year, and I trust it will meet with the approval of the Society.

A. II. BLECHYNDEN,

Calcutta, Jan. 1st, 1840.

Collector.

Statement of Receipts and Disbursements from 1st January to 31st December, 1839.

RECEIPTS.

From Members, Subscriptions collected during				
the year,	12,12	2	6	
„ Government, Annual Donation,	1,045	0	0	
„ Ditto, Monthly Allowance for 12 months,				
at 135-13-6 per month,	1,630	2	0	
				14,797 4 6
„ Proceeds of Surplus Cape Vegetable seeds				
sold,	509	0	0	
„ Ditto ditto, American ditto ditto, ...	10	0	0	
„ Ditto ditto, English ditto ditto,	6	0	0	
„ Ditto of Sugar-cane delivered from the				
Society's Nursery Garden from Oct.				
1838 to April 1839,	1,438	2	0	
„ Mr. Dearman, being the balance of 100				
Rs. awarded by the Society for the				
purchase of Dacca Cotton seed,	15	2	0	
„ Capt. Gordon, being the balance of 200				
Rs. awarded in 1838, for an experi-				
mental Garden at Nepaul,	31	8	3	
„ The Secretary, being the balance of 350				
Rs. awarded for prizes to Mallees at				
exhibitions of Vegetables held on 1st				
Feb. and 6th May, 1839,	105	0	0	
„ Proceeds of old seed boxes sold,	10	0	0	
				2,124 12 3

From Proceeds of copies of volumes of the Transactions of the Society,	461	11	9
„ Ditto, of a Duplicate work (Abererombie's Gardener) from the Society's Library,	3	0	0
„ Ditto of Stationery, being a consignment of Wedgewood's Copy books, &c. forwarded to the Society, by order of the late Secretary,	57	8	0
			<hr/> 522 3 9
„ The Executors of the Estate of the late Secretary, balance in their hands on 31st Dec. 1838, belonging to the Society,	503	1	7
„ The Acting Secretaries, balance in their hands on the 31st December, 1838, ..	1	14	6
			<hr/> 505 0 1
„ The Bank of Bengal, as a Loan,	4,000	0	0
„ Accruings of Interest on the Society's fixed Assets, lodged in the Government Savings' Bank,	748	8	9
			<hr/>
Total Receipts, Rs.	22,697	13	4
„ Balance in the Bank of Bengal on 31st December, 1838,	622	6	0
„ Balance in the Savings' Bank on ditto, ..	416	11	3
			<hr/> 1,039 1 3
			<hr/>
Grand Total, Rs.	23,736	14	7

DISBURSEMENTS.

FOREIGN VEGETABLE AND FLOWER SEEDS.

By Messrs. Adam Scott and Co, amount of Mr. Villet's bill, for Cape seeds,	1,664	0	0
„ Messrs. Noble and Sons, for English Vegetable Seeds,	371	8	3
„ Chas. Huflnagle, Esq., amount of Mr. Landreth's bill, for American Vegetable Seeds,	880	0	0
			<hr/> 2,915 8 3

AMERICAN MAIZE AND GRASS SEEDS.

„ Mr. J. J. Dixwell, for American Maize and Grass Seed, ..	212	11	0
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COUNTRY VEGETABLE SEED.

By Sheroo Chunder, Mallee, for Country Vegetable Seed, 5 4 0

ENGLISH FRUIT TREES.

„ Noble and Sons, for a consignment of English Fruit Trees, .. 56 2 7

COTTON SEED.

„ Chas. Huffnagle, Esq., an advance for a con-
signment of Cotton Seed from America, .. 1,000 0 0
„ Thos. Dearman, Esq. for the purchase of Dacca
Cotton Seed for transmission to Assam, .. 100 0 0

1,100 0 0

SUGAR-CANE.

„ Capt. Chas. Brown, for Sugar-cane forwarded in 1838, from
the Jubbulpore plantation for the Society's Nursery Garden, 671 0 0

EXPERIMENTAL GARDENS AT DEYRAH AND DARJELING.

„ Amount awarded by the Society for experimental Gardens
at Deyrah and Darjeling, 400 0 0

SOCIETY'S NURSERY GARDEN.

„ Dr. Wallich, for Mallees' wages, Cooly hire and Sundry ex-
penses incurred for cultivating the Garden from 1st Dec.
1838 to 30th November, 1839, 1,485 8 0

„ Amount paid to Messrs. Cantor and Co., on account of
Dr. Falconer, for expenses incurred in the despatch of a
Collection of Plants for the Society's Garden, 122 0 0

COCHINEAL PLANTATION.

„ Mallee's wages for superintending the Society's Cochineal
plantation in Oct. 1838, in the garden of the late Se-
cretary, 6 0 0

AGRICULTURAL IMPLEMENTS.

„ Mr. J. J. Dixwell, for several Agricultural Implements
transmitted from America, 63 8 7

FREIGHT.

„ Freight on Boxes of English, American and Cape Seeds, &c. 386 7 10

PECUNIARY REWARDS.

„ Prizes to Mallees, awarded at the exhibitions
of Vegetables held on 1st February and
3rd May, 1839, 350 0 0

„ The Branch Society at Hooghly, Annual Do-
nation awarded by the Parent Society for
prizes to Mallees, 50 0 0

„ The ditto, at Moorshedabad, ditto ditto, 50 0 0

„ The ditto, at Azimghur, ditto ditto, 50 0 0

„ James Pattie, Esq., for the best Cow exhibited
at the Cattle show on 1st February, 1839, 250 0 0

750 0 0

MEDALS.

By The Calcutta Mint for Gold and Silver Medals supplied the Society,	541	15	0	
„ Gourmohon Roy, for Engraving Medals,	25	0	0	
				<hr/> 566 15 0

SOCIETY'S TRANSACTIONS, CIRCULARS, &c.

By Baptist Mission Press for <i>reprinting</i> vol. I. of the Transactions of the Society, (300 copies,)	607	0	0	
„ Ditto, for ditto, vol. II. of ditto. (300 copies,)	967	8	0	
„ Ditto, for printing 500 copies of Annual Report for 1838,	50	0	0	
„ Ditto, for printing monthly proceedings from August to December, 1838, (400 copies for each month,)	150	0	0	
„ The Bishop's College Press, for printing Pamphlets, Nos. 2 and 3, containing "Notices on Cochineal,"	242	8	0	
„ The Hurkaru Press for striking off 500 copies of a Report of the Anniversary Dinner of the Society,	50	0	0	
„ Mr. T. Black, for Lithographing Plates for vols. II. VI. and VII.	162	0	0	
„ Mr. Tassin for ditto ditto, for vol. II.	80	0	0	
„ Messrs. Rushton and Co. for printing 500 copies of a list of the members of the Society on 1st January, 1839,	72	0	0	
				<hr/> 2,381 0 0

PRINTING ACCOUNT.

By Sundry parties for printing labels, tickets, &c. during the year,	68	0	0	
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STATIONARY.

By Messrs. Noble and Sons, for a consignment of Wedgewood's Copy Books, Styles, &c... ..	223	14	10	
„ Stationary for printing Circulars on; office books, paper, &c. for the use of the office,	167	3	10	
				<hr/> 391 2 8

LIBRARY.

By Books purchased during the year for the Society's Library,	197	5	4	
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ADVERTISEMENTS.

By Advertising in the Public Prints from 1st Nov. 1838 to 31st Oct. 1839, Notices of Meetings of the Society, Distribution of seeds, sugar-canes, &c. offers of Premia for certain objects, &c. &c.	1,021	3	6	
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ESTABLISHMENT.

By Amount for Establishment from Dec. 1838 to Nov. 1839, . . . 5,881 4 0

INTEREST ACCOUNT.

By Bank of Bengal, amount of Interest on a loan of 4,000 Rs.
for 3 months (from 7th September to 6th Dec. 1839), at 5
per cent. 50 0 0

DONATION TO MRS. BELL.

By Amount awarded by the Society to the Widow
of its late Secretary, viz:—one year's salary, 3,600 0 0
„ And from 16th Nov. 1838 to 8th Jan. 1839, one
month and 23 days, (the period from the
death of the Secretary to the appointment of a
successor,) 530 0 0
————— 4,130 0 0

SUNDRIES.

By Postage and Petty Charges, 274 0 0
„ Office Furniture, (a new mat,) 34 0 0
„ Custom House Duty on American Books and
Implements, 6 13 9
„ Government Agent, amount of Fees for the
withdrawal of Government notes, 11 4 0
————— 326 1 9

Total Disbursements, Rs. . . 23,188 2 6

Balance in the Bank of Bengal, on 31st Dec. 1839, .. . 483 8 1

Balance in the Savings' Bank, on ditto, 65 4 0

Grand Total, Rs. 23,736 14 7

REGULATIONS *for the AGRICULTURAL and HORTICULTURAL SOCIETY of INDIA, sanctioned at a General Meeting, held at the Town Hall, Calcutta, March 14th, 1838.*

ART. 1.—The promotion and improvement of the Agriculture and Horticulture of India, constitute the objects of the Society.

ART. 2.—Gentlemen of every nation shall be eligible as Members of the Society.

ART. 3.—Candidates for admission as ordinary Members shall be proposed by two Members, at a General Meeting, and ballotted for at the succeeding, when a majority of votes will determine the election.

ART. 4.—Honorary Members shall be persons eminent for their knowledge of, or encouragement given to Agriculture or Horticulture, or for services rendered to the Society. They are to be proposed and ballotted for as ordinary Members, but two-thirds of the votes are to determine their election. Ordinary Members who may peculiarly distinguish themselves in the advancement of the objects of the Society shall, on their finally quitting India, be eligible for election as Honorary Members, but they must be ballotted for as above.

ART. 5.—Ordinary Members are to pay an admission fee of 8 Rs. and the same sum quarterly, in advance, so long as they continue resident in India. It shall be optional for any Member to compound for the quarterly contributions by the payment of 400 Rs. to the funds of the Society.

ART. 6.—Members, whose absence from India beyond the Cape is merely temporary, shall continue to be borne on the list of Members, but shall be exempt from the payment of subscriptions, until their return to the country.

ART. 7.—Resident Members, allowing four quarterly bills to run into a fifth unpaid, the same having been duly demanded, shall cease to be Members of the Society and their names shall be erased from its list. Ex-members thus situated, shall not be eligible to re-election, except upon payment of all arrears: and it shall be the duty of the Secretary to bring this article to the notice of the party proposing such Ex-member, and prevent the name from being brought forward until all arrears of subscription are discharged.

ART. 8.—The Anniversary Meeting shall be held in January when the election of Office-bearers shall take place, consisting of,

1 President.

4 Vice-Presidents, two of whom shall always be Natives.

2 Secretaries, one European, and the other Native.

1 Collector.

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ART. 9.—A General Committee shall also be elected annually, consisting of the Office-bearers, and six Members. There shall besides be Select Standing Committees, for the more ready despatch of business, as shall be arranged from time to time, at the General Monthly Meetings.

ART. 10.—General Meetings shall be held at the Society's apartment in the Town-Hall on the second Wednesday of every month throughout the year.

ART. 11.—Special Meetings may be convened at any time, on a requisition to that effect, signed by at least six Members.

ART. 12.—The Bank of Bengal shall be the Treasurers of the Society, and when the surplus in their hands may amount to 1,000 Rs. it shall be invested in Company's securities, on behalf of the Society, in the joint name or names of the Secretaries and Collector for the time being.

ART. 13.—Such communications made to the Society as may be deemed of public utility by the Committee of Papers, shall be published, whenever a sufficient number have been collected to form part at least of a volume.

ART. 14.—Notice of motion shall be given on all questions relating to Finance, at a General Meeting, preceding that on which the subject is to be disposed of, in order that Members who take an interest in the question may have an opportunity of signifying their assent or objection either verbally or in writing; all such notices shall be recorded in the journals along with the Proceedings, and hung up for inspection in the Society's apartments.

ART. 15.—Motions of which previous notice has been given, shall take precedence of all others.

ART. 16.—The same rule and precedence (See Nos. 14 and 15) shall be applicable to all motions involving points of importance, and no resolutions shall be confirmed at the time of being brought forward, unless the case be urgent.

ART. 17.—Members (non-resident) applying for seeds shall distinctly state to whose care such seeds are to be delivered in Calcutta. The Society cannot undertake to despatch them.

ART. 18.—Members shall be entitled to a share of all seeds or plants purchased by, or presented to, the Society.

ART. 19.—Members shall be entitled to a copy of the Society's Transactions, published subsequently to their election. For all previously published volumes, they shall pay the cost charges. Art. 17 applies equally to the transmission of these volumes.

ART. 20.—Members of Branch Societies, and who are also Members of this Society, shall not be exempt from contributing to this Society, but they shall be entitled to a double share of all seeds distributable.

ART. 21.—Authors, whose papers may be published in the Transactions of the Society shall be entitled to 20 copies for their own private use; any more required, must be paid for at prime cost.
